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AIDS TO TEACHING ARITHMETIC
IN THE
ELEMENTARY SCHOOL

KINDERGARTEN - GRADES 1 - 6

1948

EXTRAMURAL

WEBSTER GROVES PUBLIC SCHOOLS
WEBSTER GROVES, MISSOURI

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AIDS TO TEACHING ARITHMETIC

in the

ELEMENTARY SCHOOL

KINDERGARTEN, GRADES I - VI

3/3

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29 Sept 50 Mar

FOREWORD

It is the purpose of this outline to supplement rather than to supplant the text in arithmetic. It is assumed that the sequence of number use in a modern arithmetic takes cognizance of the research of order of presentation and topics or number fundamentals to be covered. However, it seems desirable to set forth a number of opportunities for informal number experiences in the kindergarten, first, and second grades. It is further urged that teachers develop as many of the proposed visual and concrete aids as practicable, and that opportunities be provided to organize social units in which the children participate naturally and for a self-motivated purpose.

If this outline is used in the manner suggested above, the experiences it provides should prove enjoyable and profitable to the pupils.

It is appropriate to credit the John C. Winston Company for references to the teachers' guide for ARITHMETIC WE USE, and to acknowledge the courtesy of Ginn and Company for some material used in the first grade from the Buswell-Brownell-John ARITHMETIC MANUAL.

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July 1948

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TABLE OF CONTENTS

	Page
NUMBER EXPERIENCES FOR KINDERGARTEN	1
GRADE I - SUGGESTED OUTLINE	3
SOCIAL UNITS - A Number Party	12
Zoo Day	16
The Grocery Store	18
GRADE II - SUGGESTED OUTCOMES OF ARITHMETIC	20
DEVELPING NUMBER VOCABULARY	64
SOCIAL UNITS - The Cafeteria	65
GRADE III - CONCRETE AND VISUAL AIDS	67
SOCIAL UNITS - Playing Store	70
The Story of a Bottle of Milk combining Arithmetic and Social Studies	75
GRADE IV - CONCRETE AND VISUAL AIDS	80
SOCIAL UNITS - Books and Supplies in a Fourth Grade Room	87
Curtains for Room 9	93
Pop Corn Sale	97
GRADE V - CONCRETE AND VISUAL AIDS	102
SOCIAL UNITS - How We Got Weights and Measures	104
GRADE VI - CONCRETE AND VISUAL AIDS	106
SOCIAL UNITS - Publishing A School Paper	108
School Grounds Survey	113

NUMBER EXPERIENCES FOR KINDERGARTEN

Counting Experiences

1. Count children sitting at each table.
2. Count picture books at library table.
3. Count the number of plants in the room.
4. Count numbers on the clock.
5. Count number of blocks needed to build certain objects: total or for each side.
6. Count poems and songs learned.
7. Count number of boxes of crayons, pencils, scissors, etc.
8. Count number of animals seen on a trip to the zoo.
9. Count number of cups needed for milk.
10. Count number of children present and absent on various days.
11. Count number of words on pictures and charts.
12. Rote counting (clapping each count).
13. Count number of windows and doors in the Kindergarten.
14. Counting in song as children play with balls.
    b. Singing finger play songs, etc. This gives an opportunity to associate number with rhymes for the enjoyment of the rhythm in counting.
15. Counting the number of brothers and sisters of the children.
16. Counting the number of items used during a party.

Money

1. Using play money.
2. Counting money brought for lunch, the Red Cross, etc.
3. Learning to recognize the various coins - pennies, nickels, dimes, quarters, halves.

Using Number Symbols

1. Read numbers on radio dial.
2. Find page numbers.
3. Read numbers - or dates - on the calendar.
4. Read house numners.
5. Dramatic play with toy money.
6. Read numbers in shoes.
7. Play with number cards 1 to 10.
8. Discuss childrens ages.

Measuring

1. Demonstrate pint, gallon, quart containers.
2. Measure paper used in drawing, tables children sit at, items used in construction.
3. Measure distances.

Vocabulary

1. morning
2. quart
3. afternoon
4. pint
5. dozen
6. width
7. nickel
8. penny
9. dime
10. quarter
11. tall, taller, etc.
12. number
13. one, two, etc.
14. night
15. find
16. early
17. large, larger
18. small, smaller
19. high, higher
20. page
21. late
22. calendar
23. big, bigger, etc.
24. cents
25. tomorrow
26. today
27. more
28. long, longer
29. yesterday
30. money
31. all
32. many
33. count
34. thin
35. narrow
36. length

ARITHMETIC

(Suggested Outline for First Grade)

A. Overview

Children acquire certain number abilities before they come to school. The school should offer a number program that builds upon this background of experiences. It should include counting skills, opportunity to make comparisons and to think quantitatively in situations the child inevitably encounters in life. It should bridge the gap between concrete and abstract numbers. It should build readiness for each new step and teach each new step adequately when there is a need for it.

B. Test

1. Number Readiness (Gertrude Hildreth)
2. Readiness Test, How to Make Arithmetic Meaningful pp. 56-57 Brueckner-Grossmickle

C. Contents

1. Counting numbers
2. Reading numbers, 1 to 100
3. Writing numners, 1 to 100
4. Counting and reading ordinals, first through fifth
5. Money values
6. Conceot of size, quantity, location
7. Measurements
8. Addition and subtraction facts through six

D. Methods

1. Counting numbers
   a. Rote
      Imitative repetition in order by 1's, 5's, 10's

   b. Rational
      Counting objects such as:
      - Number of children
      - Number in groups
      - Number absent
      - Number present

   c. Serial
      Doing something a certain number of times
      - Knock 3 times
      - Bouncing ball
      - Tapping

2. Reading Numbers
   a. Reading numbers, as 1,2,3,4,5, etc.
   b. Reading number symbols selected at random
   c. Reading number name through ten: one, two, three, etc.
   d. Associate two numbers, (as 3 suggest 13)

3. Writing Numbers

1 to 100
2 to 100
5 to 100
10 to 100

4. Counting and reading ordinals, first through fifth:

First in line
Sit in second seat
Take the third book
Sit in fourth row
Take the fifth chair

5. Learning money values:

Identifying pieces of money: penny, nickel, dime, quarter, half dollar and dollar
Recognize cent mark and dollar sign
Stamp day
Lunch money
Carfare
Red Cross

6. Concept of size, quantity, location, time, form

Size - big, little
high, higher, highest
many, more, most
tall, taller, tallest
more, less
long, short

Quantity - dozen
$\frac{1}{2}$ dozen
pair

Location

first	over	bottom
last	under	on
far	top	in
near	middle	before
next	after	beside

Time: Yesterday today tomorrow

Calendar: Number of days
Day of week
Month of year

Morning afternoon evening

day - night
late - early
recess - noon

Clock - hour
½ hour
Time for school
" " noon
" " recess
" " get up
" " go to bed

Form - circle
square
straight
curve
round

7. Measurements

Rule marked with inch and 1/2 inch markings
Recognizing inch, foot and yard
Use any measure that group may need:
Liquid - cup
pint
quart

8. Addition and Subtraction Facts

a. Number analysis
What does 2 mean to you
What makes you think of 2
2 eyes
2 hands
2 ears
2 feet

b. Number of objects
Such as discovering different ways of grouping to make 6
(Basic idea for addition)

c. Separating groups and comparing groups
(Basic idea for subtraction)

d. Intelligent control over number combinations

e. Reading and writing combinations horizontally and vertically

Handbook of Educational Work and Play Materials
20 E. 69th Street, New York 21, N. Y.

Number Aids

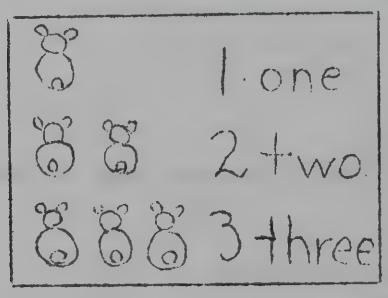
Toy money, cardboard with bills
Cash box, with bills and metal coins
Cash register
Change maker
Tokens for change maker
Liquid measure, set of three

Dry measure, set of five
Tape measure
Thermometer 36" high, with large numerals
Children's clock
Scales
A first counting board
Telephone with dial
Townsend adding board
Number puzzle
Marble runaway
Clock dial (cardboard)
Dominoes
Color count

Teacher Made Material

Blocks
Sticks
Squares of cardboard

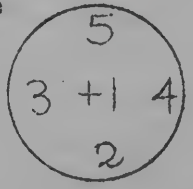
Collection of ten objects (buttons, beads, corn, etc.)
Number cards (Oak tag)
Cardboard disks (for counting)
Dominoes
Bean Bags
Cardboard clock dials
Calendar
Number chart



1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95

Number cards

Scales
Tape measure
Ruler
Yard stick
Milk bottles
Measuring cup
Gallon bucket
Marbles
Circle Game



Checkers
Play money or real money
Thermometer
Bingo game
Lotto game
Rubber balls (bouncing to count)
Counting crayons, pencils, paper, books, chairs
Jumping rope (jumping to count)
Ten pins
Stamps

Ginn and Company
2301 Prairie Avenue, Chicago 16, Ill.

Beginners Course Teachers' Manual
Pretest Pictures for the Beginner's Course (25 in set)
Number Flash Cards
Number Wall Chart
Jolly Numbers Primer
Jolly Numbers Book One
Jolly Numbers Tales, Book One

John C. Winston Company
1006-1024 Arch Street
Philadelphia, Pa.

Counting disks
Number Fact Finder
Number Frame
The Hundred-Board
The Twenty Board
Abacus
Workbook, Arithmetic We Use
Teachers' Guide for Arithmetic We Use

Scott, Foresman And Co.,
623 South Wabash Avenue, Chicago 5, Illinois

Number Readiness Chart
Number Stories, Book One
Number Chart
Manual Developing Number Readiness
Manual Understanding Numbers

Social situations in which number experiences arise

Counting children present and absent
Counting desks, chairs, books, etc.
Counting lunch money
Counting strokes of clock
Counting time rope is jumped
Counting time ball is bounced
Counting pencils, crayons, scissors
Counting bottles of milk
Counting number of doors
Counting number of windows

Counting number of pictures
Counting number of lights
Counting coats, hats, overshoes
Counting dots on dominoes
Counting numbers on radio dial
Counting coat hangers
Counting keys on piano
Counting of school days in week
Counting pieces of candy
Counting plants in room
Clapping to rhythm
Keeping weather charts
Counting marbles
Counting birds we knew
Reading calendar
Reading street addresses
Reading room numbers
Ability to use ruler
Read thermometer
Telephone number
Keeping score
Playing store
Dates of birthdays - age
Measuring height

Vocabulary

One	all	afternoon	two
count	count	morning	three
page	night	four	number
early	five	tall	late
six	taller	calendar	seven
tallest	tomorrow	eight	nickel
today	nine	pennies	yesterday
ten	dimes	thin	find
quarters	fat	large	high
narrow	larger	higher	dozen
largest	highest	pint	small
cent	quart	smaller	long
gallon	smallest	longer	pound
big	longest	first	bigger
money	second	biggest	many
third	more	length	fourth
less	width	fifth	sixth
low	heavy	inches	feet
light	yard	next	ounce
day	height	week	space
month	ruler	year	yardstick
minutes	weight	hour	scale
subtract	middle	round	time
price	center	together	circle
round	before	square	beside
long	after	short	recess
under	noon	on	top
in	bottom	smooth	count
even	add	measure	upper
gone	high	left	

Number Games

1. Ring Toss
2. Bean Bag
3. Shuffleboard
4. Tenpins
5. Ball Games

   Basket Ball
   Bouncing Ball
   Return Ball
   Number Ball

6. Marbles
7. Targets and Darts
8. Card Games
9. Dominoes
10. Tiddley Winks
11. Lotto
12. Bingo
13. Seven Up

Number Activities

Making a Feeding Board for Birds
- Measuring and sawing boards
- Deciding number of children that could work conveniently at one time
- Deciding best size of nail to use
- Keeping record number of days to make board
- Saving and counting pennies to buy bird food
- Keeping record of number of birds coming to board and number of times each day
- Discussing sizes of birds (larger, smaller, smallest)

Classroom Management
- Number of children present and absent
- Counting number of books, chairs, materials needed by class
- Counting pennies brought for Junior Red Cross
- Counting equipment at the close of the day

Constructive Activities
- Counting and distributing hammers, nails, saws
- Deciding number of children needed for activity
- Selecting various sizes and lengths for building

Planning for Parties, Trips, Sales, Etc.
- Articles needed for party, as 30 napkins, 30 cups
- Pennies collected for trip
- Price tags on articles for class sale
- Making vegetable soup, as 8 carrots, etc.
- Counting total group

Science, Social Science, Music Activities
- Counting specimens brought in for class collection
- " different type of houses in neighborhood
- Voting on various classroom issues, counting the votes
- Playing a given number of rhythmic beats on drum

Play Activities
- Dividing group into teams
- Arrangement of players on team, as John is first, etc.
- Counting points earned by each team, number of turns each child had had
- Trying to bounce ball without missing

Sharing Work at Home
- Number of persons for whom table must be set (counting silverware and plates needed)
- Helping prepare meal (Bringing 6 eggs, greasing 2 pans, washing 5 or 6 potatoes)
- Running errands (remembering items to be bought, reporting amount spent)
- Counting articles being sent to the laundry

Miscellaneous Activities

- Reading numbers on radio dials, telephone, houses, highway routes, calendars
- Personal data as: size of shoes, stockings, gloves
- Counting pennies in bank, marbles, etc.
- Designating shelves or drawers for toys as: top drawer, bottom drawer, etc.
- Counting number of cars that pass a given poiny in a short space of time
- Reading number on scales when being weighed
- Noting price of various tickets to show, etc.
- Playing games involving number as: dominoes

REFERENCES

Brueckner and Grossmickle — How To Make Arithmetic Meaningful

Brownell, W. A. and others — Arithmetic in Grades One and Two

Brownell, W. A. — When is Arithmetic Meaningful
Journal of Ed. Research 38: 489-90

Gunderson, Agnes G. Number Concepts Held by Seven Year Olds
The Math Teacher 33: 18-24

Manuals - Understanding Numbers - Scott Foresman Co.

Arithmetic We Use - Winston

Developing Number Readiness - Riess

Suggestions for Arithmetic Experiences in Primary Grades.
(Webster Groves Public Schools 1941)

Concrete and Visual Aids for Teaching Arithmetic
(St. Louis County Workshop 1945)

SOCIAL UNITS

A NUMBER PARTY

The children in the room had so much fun with numbers they decided to have a "Number Party" for their parents.

I. Discussions of Group

A. What can we do to give an interesting party?
   1. Invite guests. How?
      a. Oral invitations (word of mouth, telephone)
      b. Written
   2. Serve refreshments
      a. What can we serve?
      b. How can we serve it?
      c. Who shall we serve?
      d. We can do the serving.
      e. We can have a tea table.
   3. Plan good entertainment (Since it is a number party entertainment should be about numbers)
      a. Look for number songs
      b. Look for number jingles
      c. Look for poems about numbers
      d. Plan number games
      e. Play a number story

B. How can we finance the party?
   1. Ask parents for help
   2. Earn the money ourselves
   3. Find ways to earn money

II. Activities of group

A. Deciding on written invitation
   1. Counting number of guests to be invited
   2. Counting number of invitations to be written

B. Choosing day for the party (calendar)
   1. Counting number of days till party
   2. Choosing time of day to have party (clock).
   3. Deciding how long party should last. (Planning and estimating to allow ample time for program, eating, etc.)

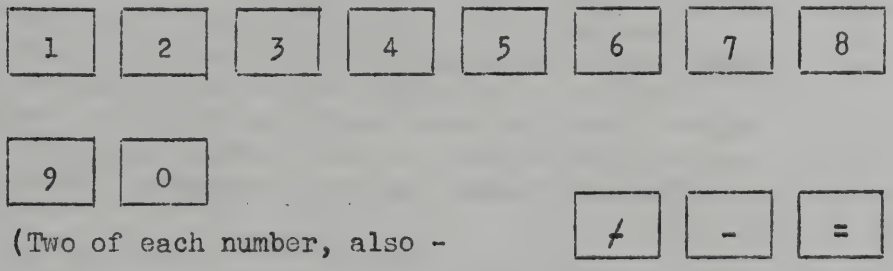
C. Deciding on punch and cookies for refreshments
   1. Counting number of cookies needed.
   2. Counting number of oranges and lemons needed
   3. Counting number of cans of fruit juice
   4. Amount of water to be added to punch (pint, quart)
   5. Making the punch

D. Deciding to have a tea table
   1. Deciding on number of candles needed for table
   2. Counting number of napkins needed for guests
   3. Deciding on numbers of mothers to serve at tea table
   4. Choosing mothers by vote. (Counting the votes)
   5. Deciding on the number of boys needed to move tea table

E. Financing the party
   1. Deciding to earn the money (learning pieces of money)
   2. Deciding on ways to make money.
   3. Telling how we made the money
   4. Writing and adding the sum each day
   5. Adding total sum.
   6. Discussing the amount and cost of things needed
   7. Shopping for best prices
   8. Adding cost of list to see if we have enough money
   9. Buying the supplies for party
   10. Writing cost of various items (writing 39, then 39¢)
   11. Recognizing cent ¢ and $ mark

F. Deciding to have party in gymnasium
   1. Have more room
   2. Guests will be more comfortable
   3. We can use stage for our program
   4. Approximating number of chairs needed to seat guests

G. Program activities
   1. Deciding how many numbers to have on one program
   2. Dividing into groups so each one may have a part on the program
   3. Choosing which group will be first, second, etc.
   4. Choosing from songs and poems four which will be the most entertaining
   5. Making number cards 9" x 12" to be used in "Number Games" as:



H. Program
   1. Choral numbers (a poem)
   2. Number Rhymes - Group 1
   3. Number Songs - Group 2
   4. Play "The Twelve Fisherman" - Groups 3 and 4
   5. Number Games - all
      a. Growing numbers
      b. Adding game
      c. Taking away

REFERENCE LIST

I. Poem

Farjean, Eleanor, "Numbers", Sing for Your Supper, p. 82

II. Number Songs

A. "Ten Little Indians", The American Singer, p. 94
B. "Seven Steps", The American Singer, p. 100
C. "Five Little Girls"", Music Hour, II, p. 27
D. "This Old Man", New Music Horizons, II, p. 120

III. Number Rhymes

A. One, Two, Three
B. Spanish Nursery Rhyme
C. Marbles
D. The Hare
E. One for the Money
F. Buckle My Shoe
G. Reed, Mary, "Counting Rhymes", A Little Golden Book

IV. Story

The Twelve Fishermen

Twelve fishermen came to the lake to fish. As they were fishing, the first fisherman said, "I think I will count to see if all are here." He counts eleven (forgets to count himself). Alarmed he shouts, "One of us is missing. I am sure he has fallen into the lake."

The second fisherman said, "Let me count. Maybe you didn't count right." The second fisherman counts only eleven. (He forgets to count himself, too.) A third and fourth try with the same result.

A traveler passes by and asks the fisherman what all the excitement is about. They tell him they are sure one of them has fallen into the lake as there were twelve and now they can count only eleven.

"Let me see you count," saif the traveler. The traveler sees that each is forgetting to count himself.

Wanting to have some fun he said, "Let me count. I think I can find your man." He counts the twelve fishermen and tells them each forget to count himself.

"Ha! Ha!," laugh all thr fishermen. "What a good joke on us."

V. Number games

A. Growing numbers
   1. Children sit in chairs in half circle
   2. Each child has a 9" x 12" card with a number on it
   3. Ones
      a. Teacher calls a number, as 3
      b. Child with 3 card comes forward, child returns to chair
      c. Teacher calls 6. Child with 6 comes forward, etc.

4. Tens
   a. Teacher calls 12
   b. Children with 1 and 2 cards come forward making 12 correctly
      Teacher may call any number between 1 and 100
      (Audience is invited to clap if numbers are made correctly.)

B. Adding game
(Use any good skipping record. Suggest: Victor 22765-A)
1. Child holding 2 card skips and bows to child + card, who follows 2.
2. 2 then skips and bows to 3 card, who follows + card.
3. 2 then skips and bows to = card, who follows 3 card.
4. They skip to front of stage and form combination: 2 + 3 = (right to left). The child who has 5 must be alert, run forward and finish the combination, as 2 + 3 = 5. (Having two cards of the same number makes the competition keener.)

C. Subtraction game may be played the same way. Child must be careful to bow to a number less than himself.

ZOO DAY UNIT

A visit to the zoo offers many opportunities for number experiences. This may be used along with an animal unit or as a separate unit.

I. Developing ability to use calendar
   - Selecting a day to go
   - Counting number of days
   - Season of year to go (Spring)

II. Counting
   - Number of children to go on bus
   - Number of children absent
   - Number of mothers that should be asked to go

III. Understanding money values
   - Handling money
   - Amouht of money needed to buy lunch
   - Identifying pieces of money
   - Use of cent mark
   - Recognizing penny, dime, nickel, quarter
   - Saving money to go on bus trip
   - Adding sum each day

IV. Developing concepts of time
   - What time shall we start
   - What time shall we return
   - How long will it take to get there
   - What time are animals fed
   - Will we be there at feeding time

V. Counting animals
   - How many animals could swim
   - " " " " fly
   - " " " " crawl
   - " " " " climb
   - " " " " dig
   - " " " live in cages
   - " " " " " pits

VI. Building number vocabulary:

Calendar	nickel	longer	time
dime	longest	spring	quarter
small	many	save	smaller
more	cent	smallest	until
buy	large	less	start
larger	money	return	largest
penny	long	size	one
first	tall	two	second
taller	three	third	tallest
four	fourth	fat	five
fifth	fatter	last	fattest

VII. Variations in size and weight

Size of cages
Which animal was largest
" " " smallest
" " " tallest
" " " fattest

Which snake was longest
" " " shortest

How many birds nesting

VIII. Ordinals

Which animal shall we draw first, second, third, fourth, fifth, etc.
Which animal did we see first, second, third, fourth, fifth, etc.

IX. Room activities:

How many animal books in our library
What pages are the animal stories on
Use table of contents
How many animals shall we draw
Oral and written (group activities) stories about individual experiences

Summary:

The number activities connected with this unit have made the study of numbers more interesting. These natural and varied number experiences have helped the children understand the meaning of, and appreciate the need for developing number readiness.

THE GROCERY STORE

I. Introduction

The store is very important in the child's daily life. He helps mother make purchases. Soon they become familiar with prices and begin to count and subtract numbers.

II. Aim

To successfully teach and guide the number activities through the first years of school life so that he may acquire the knowledge and skills considered essential in developing the solution of problems.

III. Objectives

1. To develop and increase accuracy in enunciation and pronunciation.
2. To stimulate a keen interest in learning to read number problems.
3. To develop a reasonable accuracy in visual and auditory discrimination.
4. To develop ability to listen attentively to oral problems and be able to solve them.
5. To widen the experiences of the child.
6. To train the child to think in new situations

IV. Activities

1. Building the store
2. Bringing empty food cans
3. Paper cutting
4. Games
5. Dramatization
6. Simple experience charts
7. Posters
8. Singing
9. Drawing
10. Excursions

V. Skills

1. Interpret problems
2. Reading problems for desirable reasoning
3. Writing original problems
4. Solving oral and written problems

VI. Desired Attainments

1. A knowledge of the amount of work involved in keeping record of:
   a. Number of can goods to be ordered
   b. Number of can goods sold
   c. Money paid for fruits and vegetables, meat, bread, etc.
   d. Salary paid to helpers
   e. Paying delivery men
2. Habit of seeking information
3. Habit of orderliness in record keeping
4. Attitude of courtesy

VII. Approach to the Grocery Store

1. Number of kinds of food good for us
2. Placing of price tags on articles
3. The adding machine
4. The scales
5. Checking of articles
6. Telephone orders

VIII. Experiences

1. Life situation
   a. Selling, quarts, pints, $\frac{1}{2}$ pint liquid
   b. Weighing pounds of goods
   c. Counting
      (1) Dozen of oranges
      (2) $\frac{1}{2}$ dozen of oranges
      (3) Dozen of eggs
      (4) Bottles of juices, large and small
   d. Sizes - measuring
      (1) Flour
      (2) Coffee
      (3) Sugar
      (4) Cereals
      (5) Soap
      (6) Can of food
   e. Counting stock

SUGGESTED OUTCOMES OF ARITHMETIC IN SECOND GRADE

A. Mathmetical Phase

I. Counting from 1 to 100 by 1's, 10's, 5's and 2's.

II. Identifying numbers and counting - as to find out how many in group.

III. Serial counting - counting backward and forward to tell which number came before or after.

IV. Comparative counting - separating groups - then count to see which group is more or less.

V. Group counting - as to discover various ways of grouping to get six.

VI. Increased understanding of ordinals to 10th and to 20th for superior groups.

VII. Understanding the use of tens as related to "teens" and second decade numbers.

VIII. Reading and writing numbers from 1 to 100 by 1's, 5's, 10's and 2's and to 200 or more as need may arise.

IX. To read and write Roman numerals to 12 as on clock face.

X. Concept of addition facts through 6 and through 10 for superior group.

XI. Concept of subtraction facts through 6 and through 10 for superior group.

XII. Understand simple one step problems involving use of addition and subtraction.

XIII. Concept of fractions $\frac{1}{2}$, $\frac{1}{4}$, and perhaps 1/3.

XIV. Recognize geometric forms as circle, square, triangle, and perhaps rectangle.

B. Social Phase

I. Measurement

1. Value, including money, (through quarter and through $1.00 for superior groups), stamps, tokens, and cafeteria checks.

2. Time, including clock (even and half hour), calendar, days of week, and months of year.

3. Capacity, including half-pint to gallon, bushel, and measuring spoons.

4. Weight, including ounce, pound and use of scales.

5. Distance, including inch, foot, yard, and use of rulers.

II. Location

1. Addresses of homes, school, and room numbers.
2. Pages in books, including table of contents, index.
3. Dates on calendars.
4. Objects in catalogs, cases, files, racks, etc.
5. Highway and street numbers.

III. Vocabulary and Symbols

1. Quantitative vocabulary of size, amount, shape, worth.
2. Words used to name groups as pair, herd, crowd, couple.
3. Comparisons and differences of size, shape and amount.
4. Labels and abbreviations such as qt., ¢, lb.

IV. Some suggested social activities involving use of numbers.

1. Cafeteria
2. Library
3. Bank
4. Post Office
5. Making refreshments for party
6. Planning and having a party
7. Sales for Junior Red Cross: candy, cookie, pop-corn, etc.
8. Buying gifts for Red Cross Gift Boxes
9. Keeping weather and temperature records
10. Grocery Store
11. Planning a School Garden
12. Making toys for Red Cross
13. Laying out plans for mural or play city
14. Keeping height and weight records of room
15. All games using numbers
16. Recording time and date
17. Making a seating map of room
18. Making a map of school playground

C. Concepts to Develop

I. Counting

A. Rote counting and enumeration by 1's, 2's, 5's, and 10's to 100.

("Enumeration requires the identification of the number in a group of objects; counting requires only the saying of the number names in correct sequence".)

Activities

1. Counting orally to get the exact number in a group.

2. Getting the required number of materials for a group of children.

3. Counting number of children buying lunches.

4. Counting absent children. Counting days missed by absentees.

5. Giving rhythmic beats on a tom-tom; bouncing ball to count; jumping rope.

6. Counting the number of days before a holiday or a special occasion

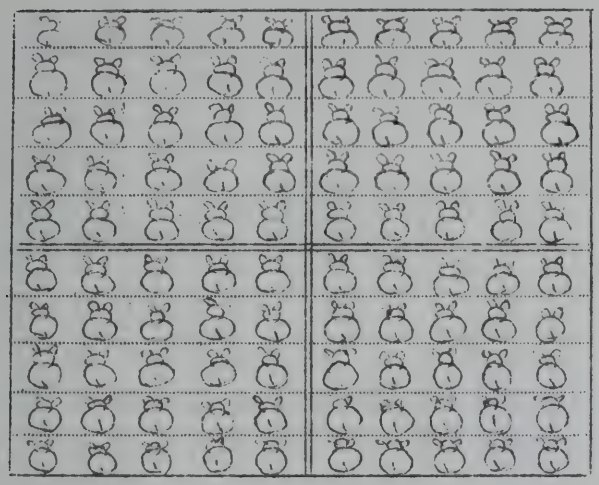
7. Counting supplies for parties.

VISUAL AIDS

Concrete Aids

Collect various types of materials such as: Buttons, colored sticks, pegs, mills, stones, milk bottle tops, meat skewers; toothpicks, disks, a tom-tom, balls, jumping rope, books, counting frame.

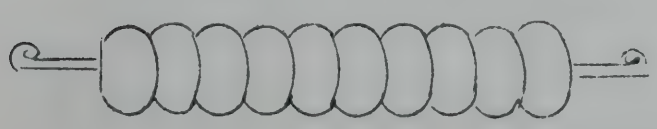
COUNTING CHART



10's NUMBER CHART

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

COUNTING FRAME



GAMES

1. Number Party

Have five or six children sit in a corner. Give all the other children numbers as names. One child comes to the first group and says, "May I come to your party?", and taps his number on the floor. The children will say, "Yes, Fourteen, (or whatever the number is), you may come in. Then another child comes. The ones in the group may take turns inviting the other children in.

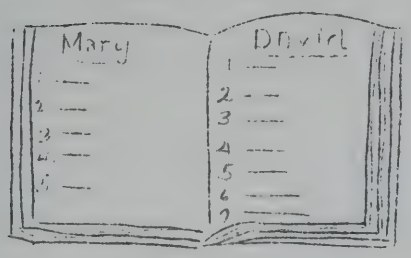
2. Blindfold

Have one child cover his eyes. The other children form a circle and march around until the one in the center says, "stop". He points at the circle with a ruler. The one toward whom he is pointing begins counting. The one in the center must guess who is counting. He has three guesses. If he guesses correctly, the one who counted must take his place. If not, he must stay in the circle one more time.

ABILITIES	ACTIVITIES
	8. Counting the number of books on the reading shelf or in the library.
	9. Counting the number of books read and recorded.
	10. Counting votes and scores using tally forms.
	11. Counting for relay races.
	12. Counting days in a week on a calendar.
	13. Counting months and seasons in a year.
	14. Counting donations to Junior Red Cross.

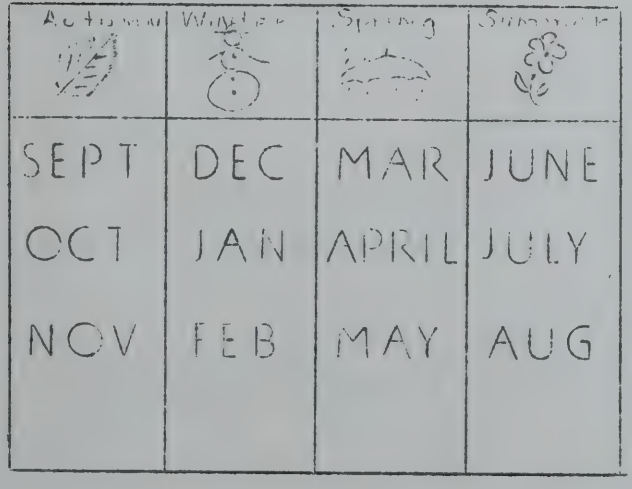
VISUAL AIDS

RECREATIONAL READING



NOVEMBER						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

SEASONS OF THE YEAR



GAMES

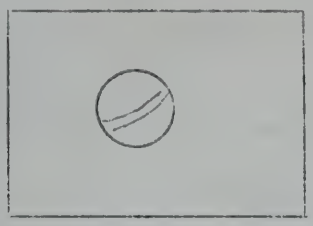
BUZZ (A game for fun)

The children sit in their seats. The first child in a row starts the counting with "one", the second says "two", the third says, "three" and so on down one row and up another. Every child to whom falls a number containing the figure seven must say "Buzz", instead of the number. If he calls the number instead he is out of the game.

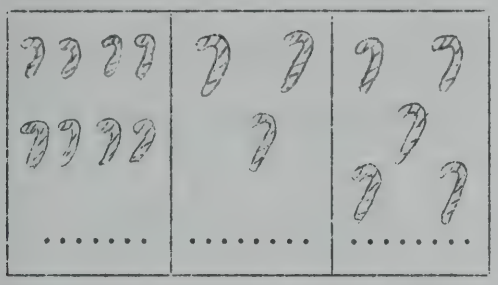
ABILITIES	ACTIVITIES
B. Comparative counting to develop the concepts of size, quantity, and location	1. Comparing separate objects to find the meaning of larger, largest, smaller, smallest, longer, longest, taller, tallest, shorter, shortest, higher, highest.
	2. Comparing groups of objects to establish the meaning of fewer, fewest, bigger, biggest, more, most, less.
C. Serial counting to determine the place of a given number in a series.	1. Finding the number that comes after, comes before, and comes between a given number.
	2. Finding the place of separate numbers in a row.

VISUAL AIDS

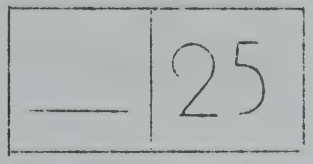
Blackboard Suggestions



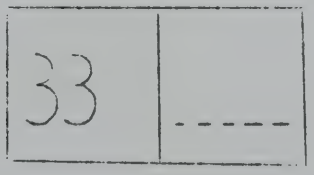
See the ball? Draw a larger ball above it. Draw a smaller ball below it. Put X on the smallest ball.



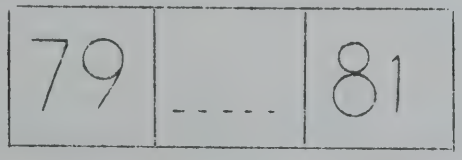
Which picture has the fewest in it?



What number comes before?



What number comes after?



What number comes between?

Can you write the numbers?

61 ___ ___ 64 65 ___

GAMES

WHERE DO YOU GO?

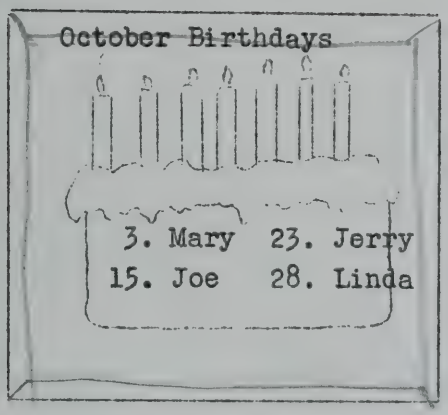
Prepare several sets of colored cards with numbers in consecutive order. Designate a certain place in the room for each set, as the back of the room for the greens. At a given signal the children take their cards to the place designated for that group and stand in the correct places. The first group to get in the correct order wins.

D. Ordinal Counting to aid in developing serial counting through 20.	ACTIVITIES 1. Finding the designated page in a book. 2. Telling dates of birthdays and holidays. 3. Giving directions: It is the fourth room down. 4. Running races: He came in third, sixth, etc. 5. Looking at pictures 6. Checking spelling words in a column: What is the tenth word?
E. Group Counting to think of numbers as groups.	1. Identifying various group patterns.

VISUAL AIDS

Concrete Aids

Books, Children,
Rows of Seats.



GAMES

DAYS OF THE WEEK

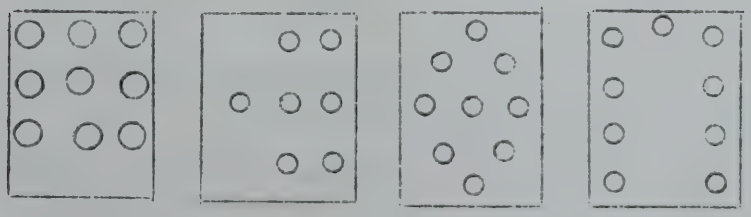
Have seven children stand in a line at the front of the room. Give each child the name of a day - the first child is Monday, the second Tuesday, etc. Have a pupil call a day as "Friday". The Friday child must step out of the line and say, "I am the sixth day of the week."

CLAP IN

Have the children seated in chairs arranged in rows. One child starts the game by going to another and saying, "Please move to the fourth chair in the fifth row" (or some other designated chair). The child spoken to must go to this place and say to the child sitting there, "Please move to _ _ ." If the child goes to the right place, the other children clap. If he goes to the wrong place, they shake their heads.

Concrete Aids

Flash cards, pictures, beads, blocks,
colored paper circles, buttons, children



2. Breaking down a number into two smaller numbers

3. Matching numbers, designs and groups.

4. Understanding the function of ten as related to "teens" and second decade numbers.

II. READING and WRITING NUMBERS to 200 or more wherever they appear.

1. Finding pages in the table of contents.

2. Making a "table of contents" page for a booklet or magazine.

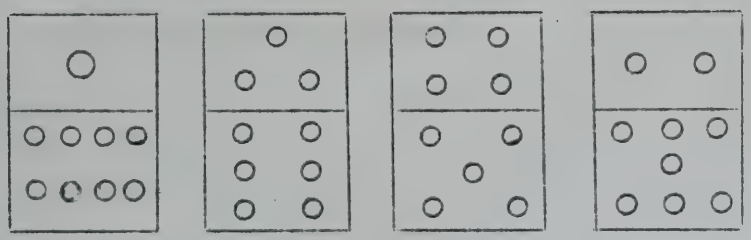
3. Numbering the pages in a booklet.

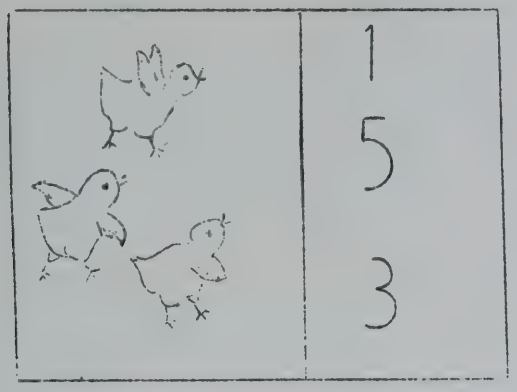
4. Telling own house number with street and showing it on blackboard or room directory.

VISUAL AIDS

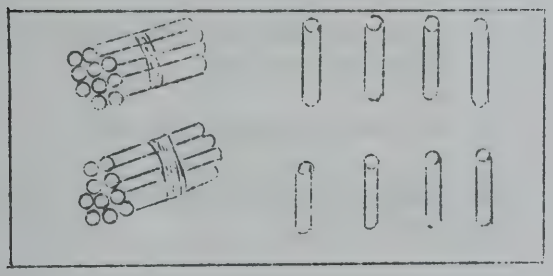
GAMES

Card Suggestions





Small cards 1½ x 3 inches
colored sticks, rubber bands



____TENS ____ONE'S

_____IN ALL

Room Directory

Name	Address	Telephone
Allen	416 Maple	We 2391
David	210 Oak	We 3390
Linda	116 Reavis	Re 2121
Peter	309 Jackson	We 2864

POSTMAN GAME

Give each child a card with a number which is his "house number." One child is selected as postman and is given a number of cards or envelopes with groups of marks on them corresponding to the house numbers. He must deliver these to the right places. If he makes a mistake, the child at whose house the mistake is made then becomes the postman.

5. Finding own telephone number in telephone directory and showing on the board how it looks.

6. Telling automobile license number.

7. Reading dials on the radio. Locating stations by numbers from radio programs in newspaper.

8. Reading prices from newspaper advertisements.

9. Reading numbers in recipes.

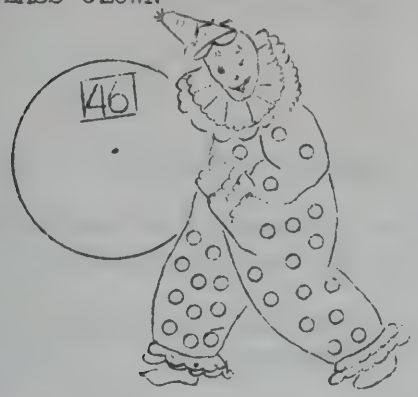
10. Reading room numbers in the building.

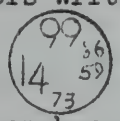
11. Reading numbers in blackboard directions.

12. Reading questions on a chart specified by number.

13. Reading the numbers to show the sequence of activities on a program.

CLASS CLOWN



Clown's balloon consists of two pieces of cardboard fastened with a Brad. The back cardboard has numbers written around the edge as 

The front of the balloon has a cut out square. Children turn back piece and read numbers.

PROGRAMS ON THE AIR

KSD	KXOK	KMOX	WIL	KWK
550	630	1120	1250	1380

BUILDING DIRECTORY

Room Number	Teacher	Floor
100	Miss Brown	First
101	Miss Smith	First
102	Miss Allen	First
200	Mrs. Jones	Second

1. Which is larger $\frac{1}{2}$ or $\frac{1}{4}$?
2. Which is smaller $\frac{1}{4}$ or 1/3?
3. How many tens has 70?
4. What number comes after 69?
5. How many dimes are in a half dollar?

14. Making price tags.

15. Reading game score.

16. Writing number of votes on board for comparison.

17. Keeping daily record of attendance.

18. Making a calendar.

19. Reading numbers on calendar

20. Recording data of some outstanding event as birthdays, trips, holidays, planting of seeds.

21. Reading numbers on the thermometer.

22. Keeping a temperature record by reading the thermometer.

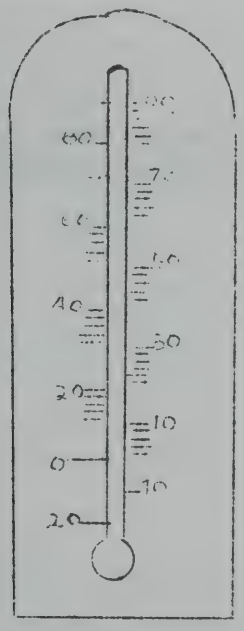
23. Recording number of windy days, sunny days, etc., during month.

1¢ 5¢ $1.00

SCORE BOARD

	Balls In	Balls Out
JERRY	𝍸 II	III
BETTY	IIII	𝍸 I
BILLY	𝍸 III	II

CLASS THERMOMETER
(Use colored thread to designate outside temperature)



BASKETBALL

Place a mark on the floor to show where the child is to stand. Eight or ten feet from the mark an empty waste basket is placed. The child is given ten balls which he tries to throw into the basket. When he has ten throws, he records his score. (Note score board)

WEATHER CALENDAR

Sunny	Rainy	Snowy	Cloudy	W (Windy)	S (Stormy)	
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

25. Placing numbers on a clock face, post office boxes. etc., in unit activities.

26. Writing Roman numerals through 12 on a clock face.

27. Keeping a chart of individual progress.

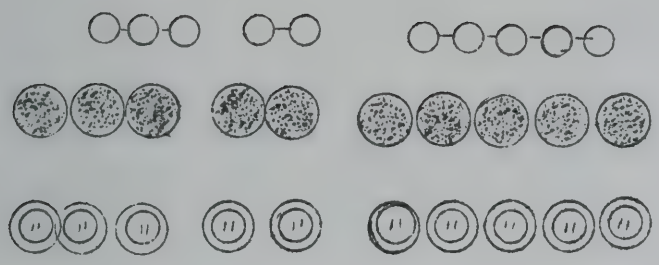
28. Reading numbers on scales when being weighed.

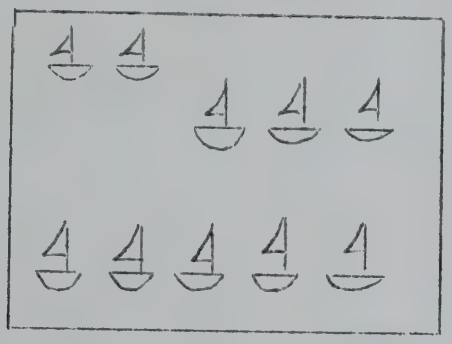
CHART
INDIVIDUAL PROGRESS

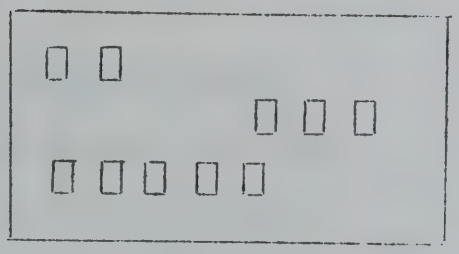
WHAT CAN I DO IN ARITHMETIC?	
I can count by 1 to 100.	
I can count by 10 to 100	
I can count by 5 to 100	
I can count by 2 to 100	
My name is JOHN	

ABILITIES	ACTIVITIES
III. Concepts of addition To understand the meaning of the addition process and the basic facts through 6 and perhaps 10.	Presenting a basic fact of addition. Count concrete objects to find a sum - chairs, books, children. Count smaller objects: Beads - buttons - discs Beads on an abacus. Study and make picture representation of facts. Study and make semi-concrete symbols: circles, squares, dots, stars. Place pictorial illustration on blackboard - change pictures to numbers - then in vertical form.

VISUAL AIDS







2 AND 3 ARE 5

2 + 3 = 5

$$\begin{array}{r} 2 \\ +3 \\ \hline 5 \end{array}$$

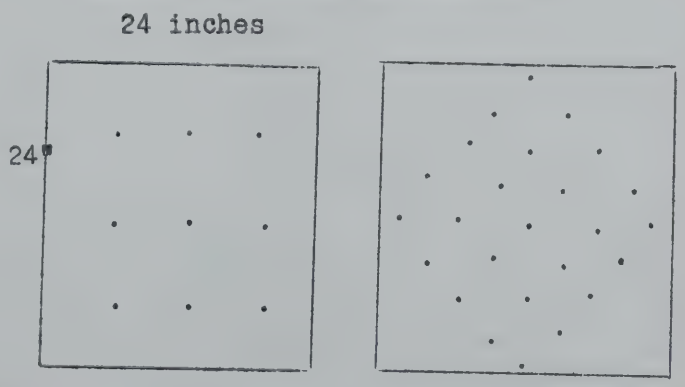
GAMES

Ring Toss

This game requires (1) large board set with pegs (nails, hooks, screws) placed a few inches apart and several rubber rings. The pegs are numbered 1 to 6 or 1 to 9.

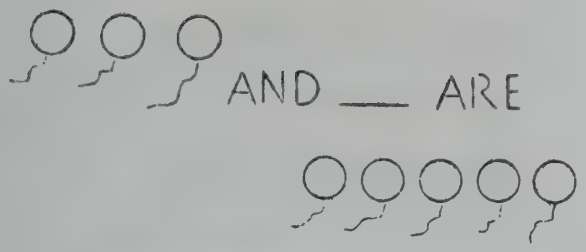
Each player is given 2 rubber rings which he tosses over the pegs. His score is the sum of the numbers on the peg covered. The winner in each round is the player who succeeds in covering the numbers giving the largest sum.

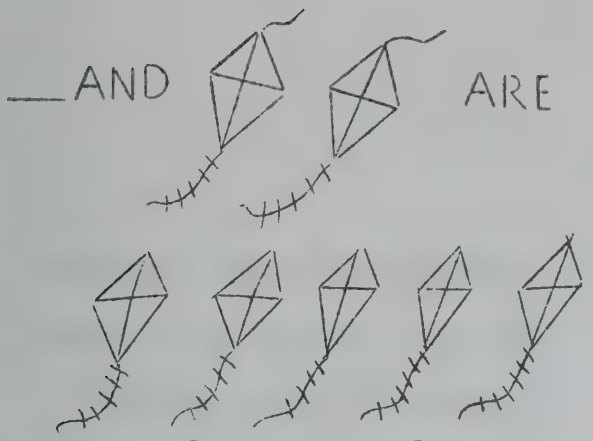
RING TOSS TARGETS



ABILITIES	ACTIVITIES
	Make or tell other stories about some number facts.
Help pupils discover relationship of number facts or to understand term "Number families".	Arrange by use of discs and other concrete aids so that the fact, that $1 \nearrow 2 = 3$ is the same as $2 \nearrow 1 = 3$, is discovered.

VISUAL AIDS

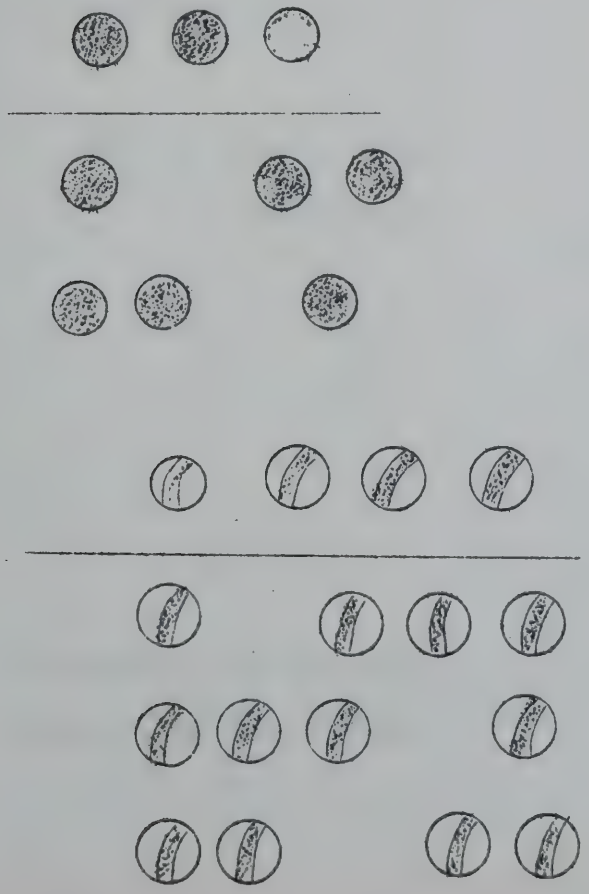




3 AND ___ ARE 5

3 + ___ = 5

$$\begin{array}{r} 3 \\ +\,? \\ \hline 5 \end{array}$$



GAMES

Bean Bags

Bean bags should be made of heavy closely woven material and should be about 6 inches square. Filled with about $\frac{1}{2}$ pound of dried peas, beans, or corn.

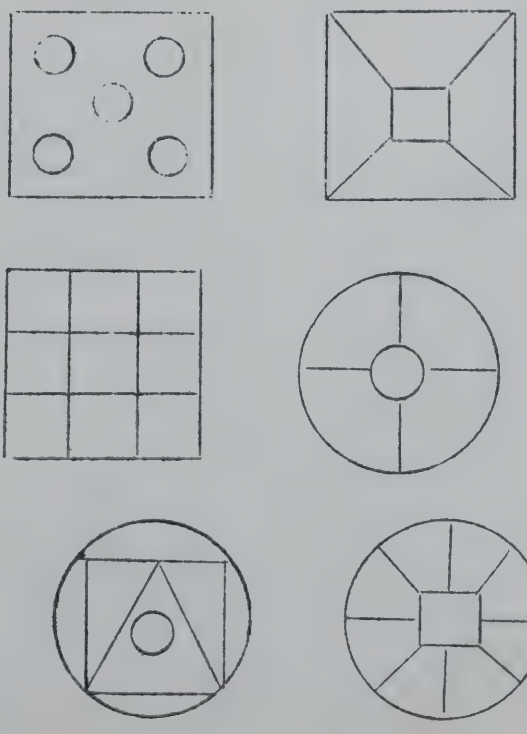
Bean Bag is played by allowing each player two bags. His score is the total of two throws.

Flat floor targets may be made on floor with chalk or on heavy brown paper or painted on oil cloth.

If bag falls on line call zero fact, or give it large number.

PLANS

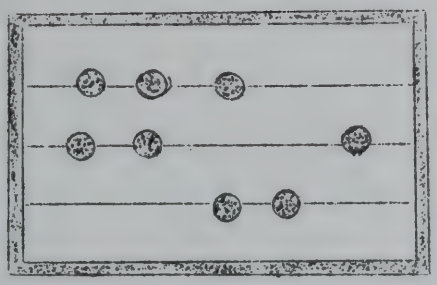
18 inches

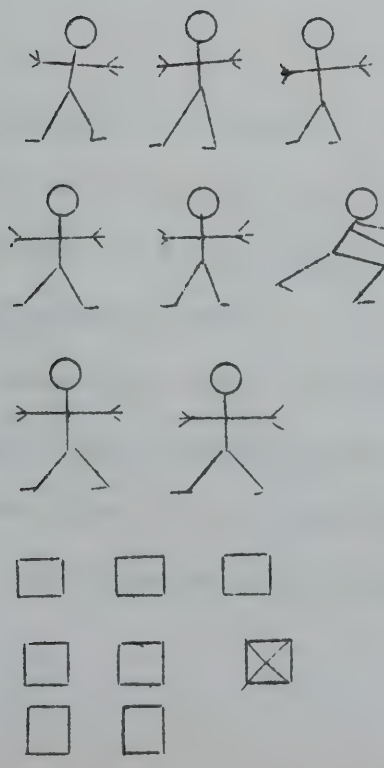


ABILITIES	ACTIVITIES
IV. Concepts of subtraction. To understand the meaning of the subtraction process and the basic facts through 6 and perhaps 10.	Presenting a basic fact of subtraction.
	Count concrete objects; Separate or take away, count to see how many are left.
	Count smaller objects and take away and count to find how many are left. Buttons, disks, mills.
	Study and make picture presentation.
	Study and make semi-concrete symbols. Circles, squares, etc.

VISUAL AIDS

Children in group, chairs, books, etc.

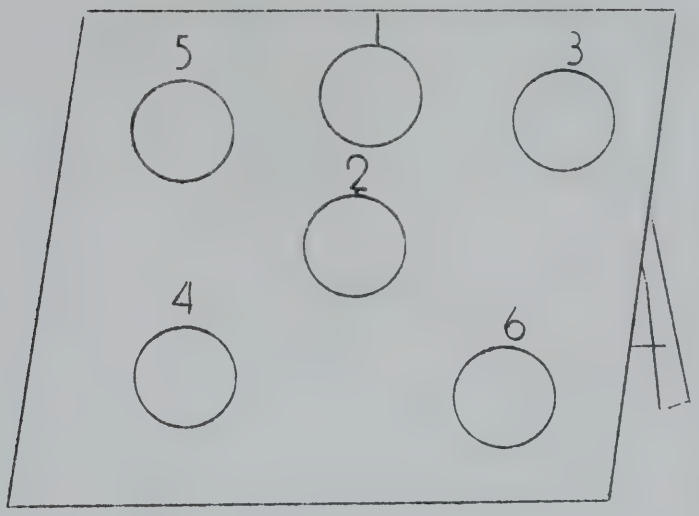




GAMES

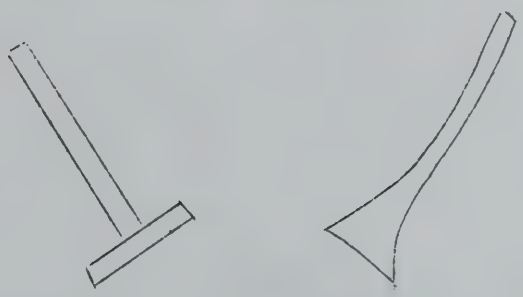
Bean Bag (Cont.)

Inclined Board with holes.



Number of holes varies upon number of primary facts the teacher wishes to use.

S H U F F L E B O A R D



Checkers or flat tin blacking boxes filled with sand can be used for pushing. The floor can be marked with chalk and sums and differences practiced.

2	2	6
	5	4
	3	7

ABILITIES	ACTIVITIES
	Place pictorial illustration on blackboard. Change picture to numbers. Then write in vertical form.
	Make or tell other stories about same number fact.
Some suggestions concerning presentation of both subtraction and addition facts.	No one order for teaching basic fact in addition has been shown superior. There are two methods - either by adding 1 to all digits, then 2 and so on - by number families, all facts which make 4 etc. Family method suggested for primary grades.

VISUAL AIDS

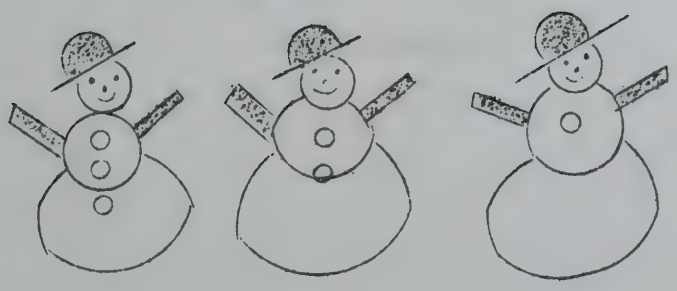
□ □ □ TAKE AWAY □ ARE □□

3 TAKE AWAY 1 ARE 2

3 - 1 = 2

$$\begin{array}{r} 3 \\ -1 \\ \hline 2 \end{array}$$

MAKE ALL SNOW MEN LIKE FIRST ONE.



GAMES

Ten Pins

Use ten commercial, wooden, rubber, or paper mache. Use rubber balls for tumbling pins. Count either the pins knocked down or count the pins standing and subtract from 10 to get the score. Adapt distance to materials and available room.

Ball Games

1. Basketball

Balls thrown into a basket or other container. May be scored by allowing each ball count the number of points decided upon. The player getting most points wins.

2. Bouncing Ball

A ball bounced upon floor and hits a circle on a board.

3. Return Ball

A return ball is bounced at a target.

4. Number Ball

A ball is used to knock numbered balls from a line on the floor.

ABILITIES

ACTIVITIES

Since both processes are new to first and second grades, confusion can be eliminated by presenting each process and its symbols separately.

The phraseology recommended for first or second grade is "take away" in subtraction - 3 take away 1 are 2.

Present the number as a whole and break down into parts in either addition or subtraction.

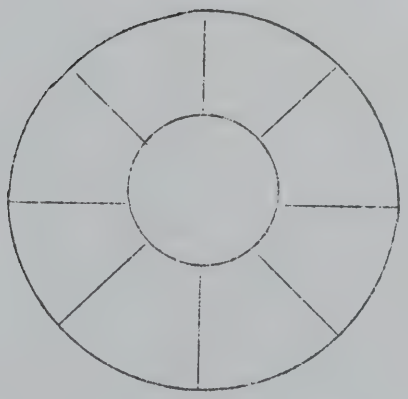
Have facts in many of social and life experience situations before any practice for automatic responses. Perhaps no attempt to get automatic response should be attempted in the first or second grades.

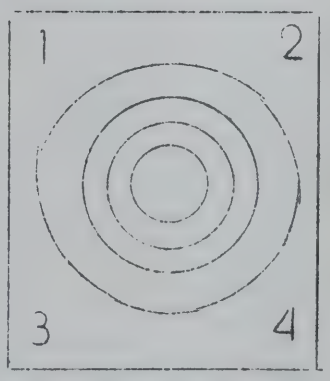
Marbles

Marbles may be rolled onto a floor target - through semi-circular arches cut in the lower edges of a board - dropped through holes in an inverted box.
Primary addition or column addition may result.

Targets and Darts

Should be 2 feet square. Arrows or darts may be made from nails, corks, and feathers.

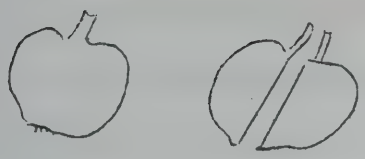


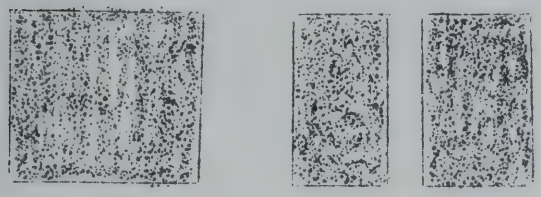


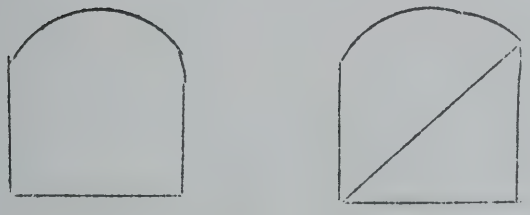
Card Game Twinks

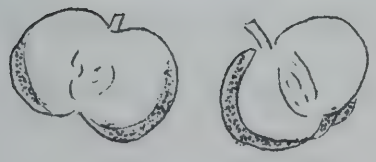
Twinks is played with four sets of cards numbered 1 to 5 or whatever sum you want to use. The player turning up the card that brings the sum to 6 gets all the turned cards of other players.

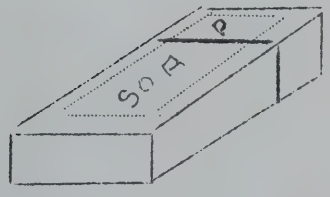
ABILITIES	ACTIVITIES
V. Concept of fractions 1/2, 1/4 and perhaps 1/3.	
To understand the meaning of fractional parts so far as 1/2 and 1/4 and perhaps 1/3, too.	Introduce the half 1/2 concept with whole objects such as apples, candy bars, crackers, sandwiches. Cut objects and have children cut them. Put back together to show whole.
	Divide some things into unequal parts and some into halves and others as wholes. Identify halves and parts not halves. Show why answers are correct.





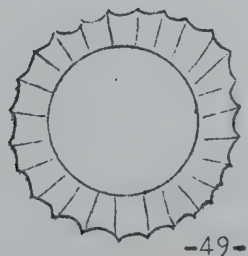




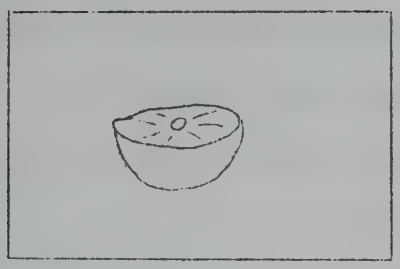


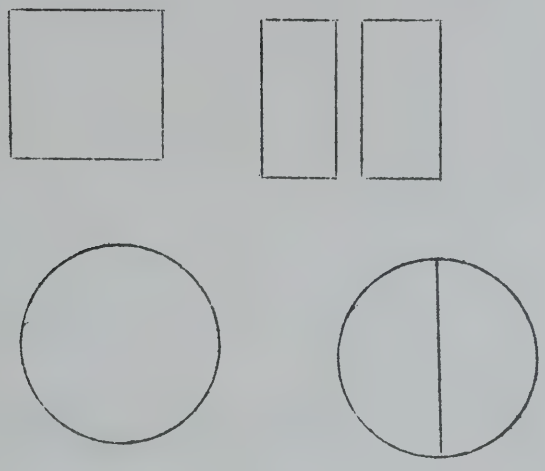
OTHER COMMERCIAL GAMES SUGGESTED:

PARCHESI
DOMINOES
TIDDLY WINKS
LOTTO
BINGO

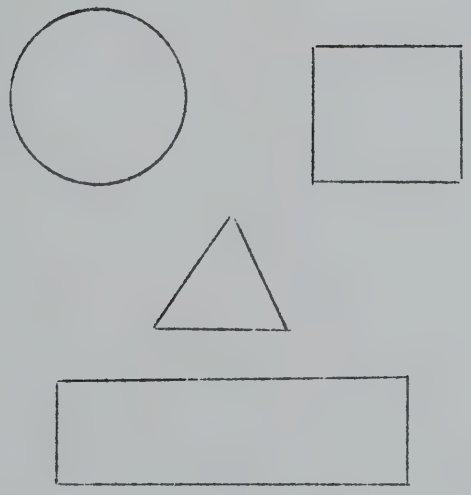
PAPER PLATE 

ABILITIES	ACTIVITIES
	Show meaning of halves among semi-concrete objects - such as pictures and then with geometric materials.
	Bring out social application as in money - telling time, dozen, inch, and measuring cups etc. Use in all social units.





ABILITIES	ACTIVITIES
VI. Concept of geometric figure. To recognize these geometric figures - circle, square, triangle and perhaps rectangle	Have children make circles, squares and triangles when playing games, calling the figures by names. Use terms when constructing things or in drawing. Show pictures of circles, etc. Have children find things in room of that form or think of things which are of that form. Cut paper forms and draw forms.



12
1
2
3
4
5
6
7
8
9
10
11

ABILITIES

ACTIVITIES

Mix paper figures and have children identify circles, etc.

Color all circles red and all triangles blue, etc.

SOCIAL PHASE

I. MEASUREMENT

A. Money

Recognition, value and use of the mill, penny, nickel, dime, quarter, half-dollar and dollar.

1. Buying lunch checks.
2. Paying street car fare.
3. Purchasing food for party refreshments.
4. Buying tickets for school activities
5. Buying gifts.
6. Buying Christmas tree.
7. Making a stamp book, using cancelled stamps with money values indicated.

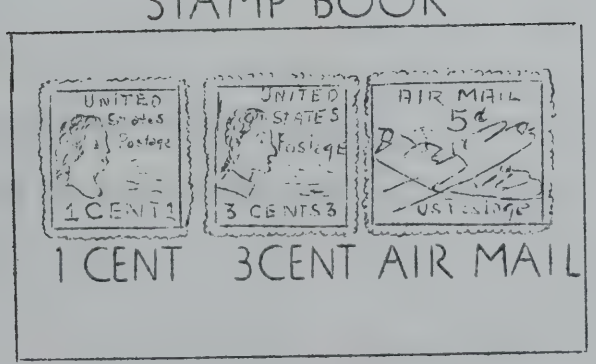
CONCRETE AIDS

Pennies, nickels, dimes, quarters,

half-dollars, dollars, mills,

school lunch checks, stamps.

STAMP BOOK



B. TIME

Reading clock by hour and half hour. Knowing days of week and months of year.

1. Reading time questions and responding by moving hands on clock face to correct position: What time do you get up? Go to bed? Come to school?

2. Telling when one is late for school, morning or afternoon, using clock face.

3. Making a very simple time table of child's daily schedule.

4. Reading a calendar

C. CAPACITY

Understanding of half-pint, pint, quart, gallon, and measuring spoons.

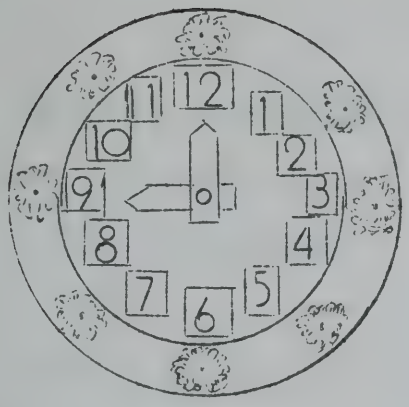
1. Using measuring cup and spoon for making cocoa, cookies, ginger bread, candy, etc. for parties.

2. Bringing in pint and quart milk bottles for comparison with half-pint milk bottles.

CONCRETE AIDS

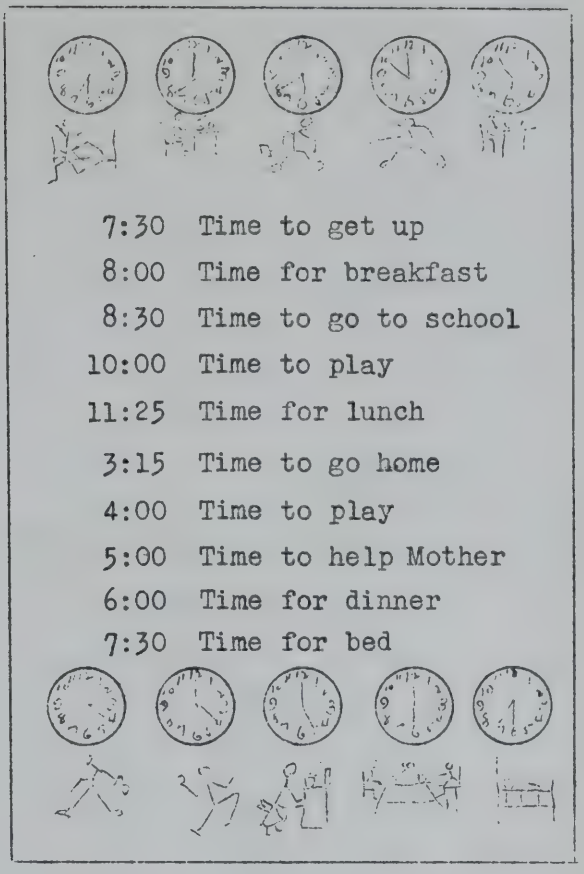
Calendar, toy clock, real clock,

small individual clocks



Individual clocks can be made from 9-inch paper picnic plates. Numbers can be cut from old calendar pages. A design can be made on outer edge of plate.

DAILY SCHEDULE


7:30 Time to get up
8:00 Time for breakfast
8:30 Time to go to school
10:00 Time to play
11:25 Time for lunch
3:15 Time to go home
4:00 Time to play
5:00 Time to help Mother
6:00 Time for dinner
7:30 Time for bed

Concrete Aids

Half-pint, pint, and quart bottles for containers, measuring spoons, measuring cups, boxes in various sizes, half-bushel, and bushel baskets.

3. Using quart and gallon containers to fill aquarium.

D. QUANTITY

Meaning of dozen, half-dozen and pair

1. Learning that 12 eggs make a dozen when planning Easter party

2. Bringing and using egg boxes to plant a dozen seeds, or to hold a dozen Christmas tree ornaments

3. Buying pair of sox for Junior Red Cross

CONCRETE AIDS

Dozen and half-dozen
egg boxes, pencils,
sticks, rubber bands

E. WEIGHT Concept of ounce and pound	1. Reading scales when being weighed
	2. Weighing letters and packages
	3. Weighing lunches
	4. Keeping record of individual growth in weight
F. DISTANCE Relationship between the inch, the foot, and the yard	1. Using foot rule to measure inches in making booklets
	2. Measuring lumber by yard, feet, and inches in constructing stores, etc.
	3. Measuring pupils, tables, book cases, etc.
	4. Getting required distance for standing in throwing balls, beanbags
	5. Measuring material for gifts

Concrete Aids

Postal scales, weight

scales

Concrete Aids

Foot rulers, yard stick,

tape measure

DEVELOPING NUMBER VOCABULARY

As the children participate in their numerous activities at school they learn the meaning of words that express:

Size and length
big, little, small, large, short, long

Order
first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth
before, after, next, last

Comparison
smaller, smallest, longer, longest, taller, tallest, shorter, shortest, more, most, less, larger, largest, fewer, fewest, bigger, biggest, higher, highest

Quantity
pound, half-pound, dozen, pint, cup, quart, gallon, half-gallon, inches, feet, yard, teaspoon, tablespoon

Position
before, after, top, middle, bottom, above, below, highest, lowest

Form
round, circle, square, triangle

In counting and working with number combination the children learn many mathematical terms:

count, add, subtract, sum, answer, the difference, take away or less, whole, half, the same size, and (meaning add), pay, bought, paid, are (meaning equal), saved, have left, earned

In telling and reading story problems the children become familiar with problem expression:

How many in all?
How many are gone?
How many are left?
How many more?
Who has more or less?
Which is more or less?
Which will buy more or less?
Who has the most?

SOCIAL UNIT

THE CAFETERIA

I. Introduction

The children have decided to have a cafeteria which we expect to help increase their abilities to meet practical number situations in their daily lives.

II. Purpose

A. To use numbers in a social studies unit.

III. Approach

A. Building the cafeteria

1. Numbers of boxes
2. Nails (how many?)
3. Paint the cafeteria (how many cans)
4. Tools for building
5. Making the cash register

B. Deciding on the equipment

1. Counting number of chairs
2. Deciding on number of tables
3. Counting number of plates needed
4. Counting number of trays needed
5. How many knives, forks, spoons
6. Counting to see how many glasses

C. Planning the menu (Using Health Book)

1. Milk (number of bottles)
2. Fruit (how many of each kind)
3. Bread (how many loaves)
4. Butter (pounds)
5. Eggs (how many dozen)
6. Soup (bowls)
7. Cookies (how many)

D. Helpers

1. How many cooks, servers, and cashiers
   (a) How many minutes to serve

IV. Activities

A. Excursion to cafeteria

B. Activities to accompany all excursions, much discussion about information gained

C. Choosing time to use the cafeteria

1. Learning the time (clock)

D. Choosing the numbers of helpers

1. Deciding and counting minutes to work

E. Furnishing the cafeteria

1. Empty milk bottles from home for number of children

2. Collecting odd glasses at home

3. Collecting magazine pictures of fruits and flowers

4. Gathering flowers and bringing vases

F. Numbers

1. Counting the stock

2. Recognizing simple combinations

3. Forming some idea of measure as : dozen, half-dozen, pound, half-pound, gallon, quart, pint and half pint

4. Making change

G. Art

1. Making money

2. Modeling eggs and fruits

3. Making posters

4. Making out menu sheet

5. Making price tags

CONCRETE AND VISUAL AIDS

To be used with the text, ARITHMETIC WE USE. First half of the year.

CHAPTER I		WE LEARN TO USE NUMBERS
	Page 1	Follow directions in Manual, p. 66, then use counting disks (Winston)
	Page 2	Blackboard demonstration by teacher
	Page 3,5	Place Value Pockets (See Manual, p. 66)
	Page 6,7	Hundred Board (Winston)
	Page 9-11	Number Fact Finders, 2nd year (Winston) Number Frame, 2nd year (Winston) Counting Disks (Winston) Games (See Manual, p. 61)
	Page 12	Pupil-made practice cards (See Manual, p. 70)
	Page 13	Hundred Board (Winston)
	Page 14,15	Counting Disks (Winston)
	"16,18,19	Number Fact Finders, 2nd year (Winston) Number Frame, 2nd year (Winston) Hundred Board (Winston)
	Page 20	Pupil-made practice cards
	Page 21	Number Fact Finders, 2nd year Number Frame, 2nd year
	Page 22-24 26-27	Use pictures - Teacher at blackboard, and children at desks to illustrate number facts
	Page 2	See Manual, p. 25
	Page 28	Place Value Pockets for Set 3, exercise 2
CHAPTER II		ADDITION AND SUBTRACTION
	Page 32,33	Counting Disks (Winston)
	Page 35,36 38	Number Frames, 2nd year (Winston) Number Fact Finders, 2nd year (Winston)
	Page 40-42	Counting Disks (Winston)
	Page 44-46	Counting Disks (Winston)
	Page 48,49	Place Value Pockets (Winston) See Manual, pp. 78-79
	Page 52,53	Counting Disks (Winston)
	Page 55,57	Place Value Pockets (Winston) See Manual, p. 81
	Page 58	Toy Money, or real coins (See Manual, p. 82)
	Page 59	Place Value Pockets (Winston)
	Page 61,62	Toy money or real coins (See Manual, p. 83)
	Page 63	See Manual, p. 83
	Page 64	Place Value Pockets (Winston)
	Page 65,66	Counting Disks
	Page68-70	Place Value Pockets
	Page 70-71	Counting Disks
	Page 73	Have children bring containers in which things are sold
	Page 74	Place Value Pockets
CHAPTER III		WE LEARN TO TELL TIME
	Page 82,83	See p. 87 in Manual, and use Counting Disks to present orderly arrangements before presenting pages 82 and 83 of text

Page 84-86	Large clock face for teacher's demonstration Small clock faces for childrens' use. See Manual, pp. 88-89
Page 88-89	Counting Disks
Page 91-93	See Manual, pp. 90-92
Page 94-95	Counting Disks
Page 98-99	Milk bottles (qt. pt. $\frac{1}{2}$ pt.) measuring cup and drinking glass ($\frac{1}{2}$ pt.)
Page 100-101	Ring Toss as pictured, or bean bag game made on floor
Page 103	Measures or bottles - gal. qt. pt.
Page 104-105	Counting Disks
Page 106	Picture poster (See Manual, p. 94)
Page 107	Pictures brought in by children

CHAPTER IV WE LEARN TO MEASURE

Page 112,113	Place Value Pockets. See Manual, p. 96 for specific directions for arrangement of work
Page 114-117	Foot ruler for each child. Manual, p. 97
" 122,123,126	Place Value Pockets
Page 130-131	See Manual, pp. 100-101. Place Value Pockets
Page 134,135	Place Value Pockets
Page 136	Toy money, or real coins
Page 137	Calendar. See Manual, pp. 102-103
Page 142	Individual Practice Cards for Combinations
Page 147	Have children make a telephone directory of their own telephone numbers

(Second Half of Year)

CHAPTER V WE LEARN TO SOLVE PROBLEMS

Page 148-150	Counting Disks) Practice Cards) See Manual, pp. 105-106
Page 152-155	See Manual, pp. 106-113
Page 156-157	Counting Disks
Page 160-163	See Manual, pp. 113-120
Page 168-169	Counting Disks
Page 178	Toy Money, or real coins
Page 179	Place Value Pockets
Page 184-185	Toy Money. Have a store in room, have children make their own price tags and their own toy money

CHAPTER VI WE LEARN ABOUT MULTIPLICATION

Page 192-194	Manual, pp. 124-129
Page 195	Place Value Pockets; pennies, dimes, dollar
Page 196-199	Place Value Pockets - Manual, pp. 129-130
Page 200	Foot ruler, yardstick
Page 201	Place Value Pockets
Page 203	Place Value Pockets
Pages 204,206 210	Counting Disks
Page 211	Toy Money
Page 213	Counting Disks
Page 223	Place Value Pockets

CHAPTER VII. WE LEARN ABOUT DIVISION

Page 226	Place Value Pockets
Page 228-229	Clock Face - large for teacher, small one for each child. Manual, p. 138
Page 230	Place Value Pockets
Page 232	Clock Faces (see for p. 228) Manual, p. 139
Page 233,235	Place Value Pockets
Page 237, 239 241	Counting Disks
Page 242	Toy Money
Page 246-248	Counting Disks

CHAPTER VIII THE THREES

Page 260-264	Counting Disks
Page 265	Place Value Pockets (Manual, pp. 145-46)
Page 268	Counting Disks
	Individual Practice Cards
Pages 269-270	Counting Disks (Manual pp. 146-147)
Page 271	Place Value Pockets
Page 272	Scales to weigh small amounts (household scales)
Page 273	Mailing scales
	Clinic Scales

PLAYING STORE

Overview

Children learn through activity. Children get suggestions for classroom activities from pictures in their textbooks.

The class was ready to begin studying the handling of money. There was a picture in the textbook illustrating children playing store in their room. The group wanted to have a store in our room.

One class period was spent in making plans for the store. The group discussed the different kinds of stores. It was decided by the children to have a toy store. The name chosen for the store was "Goodall Toy Store". Each child volunteered to bring a toy for the store. One little boy brought a cash register.

After the plans for the store were made, there was another problem. This was "What are we going to use for money?" Several children said they would bring some play money. This solved the problem of dollars, but we did not have access to any toy coins. One little girl suggested making the coins out of cardboard. This led to a discussion of the different kinds of coins and their value.

The next problem was to choose a place in the room for the store. It was decided that the book cases in the back of the room would make good shelves and the library tables could be used for counters.

After the plans for our store were made, the work was begun. The children were divided into groups. One group made the money from cardboard. Another group made price tags. The other group arranged the store. One little girl made the sign.

A banker and two storekeepers were chosen. "Goodall Toy Store" in room 205 was ready to open.

Two children were selected to come to the store and buy something. The children were observed as they bought a toy or book.

While some of the children were working in the store, the others were doing seatwork. This gave the group the training in concentration on seatwork while there was activity in the room.

It was interesting to observe the children as they acted as storekeepers and customers. They selected the toys as they would in a regular store. One alert boy said, "I'm going to buy more than one thing so he will have to add the prices and make the change."

Each child had an opportunity to be storekeeper and to be a customer. Some of them were bankers. Those who needed the most help had several opportunities to be storekeepers.

The children learned much from this activity. They all enjoyed working in the store and regretted it when the store closed.

Purposes

1. To give the children an opportunity to learn through activity.
2. To train the children in class discussion by having them make plans for the store.
3. To teach the group the value of different coins.
4. To have the group compare the sizes of coins.
5. To give the children experience in pricing articles.
6. To give the children the opportunity to work in groups.
7. To give the children experience in attractive arrangement.
8. To give children experience as bankers, storekeepers, and customers.
9. To teach children how to make change.
10. To give the children an opportunity to tell about the project when completed.

Study Guide Questions

1. What are the different kinds of stores?
2. What are the different kinds of coins?
3. What is the value of these coins?
4. What do toys cost?
5. How do you make change?

I. Store

A. Kind of store
   1. A discussion of different kinds of stores
   2. It was decided to have a toy store
   3. The store would have a book counter
   4. Each child would bring a toy for the store
   5. The name of the store was "Goodall Toy Store."

B. What to use for money
   1. Play money
   2. Coins were made out of cardboard

C. Where to have the store
   1. Book cases in the back of room were chosen for shelves
   2. Library tables were used as counters

D. Setting up store
   1. Three groups chosen
      a. Money
      b. Price tags
      c. Arranging store
   2. Sign for store was made by one girl

E. Playing store
   1. Choosing storekeepers and bankers
   2. Selecting customers
   3. Storekeepers making change
   4. Customers counting change

II. Facts About Money

A. Kinds of coins and their value
   1. Penny - one cent
   2. Nickel - five cents
   3. Dime - ten cents
   4. Quarter - twenty-five cents
   5. Half-dollar - fifty cents
   6. Silver dollar - one dollar

B. Paper money
   1. One dollar
   2. Five dollars
   3. Ten dollars
   4. Twenty dollars

C. Counting money
   1. 5,10,15,20, etc.
   2. Dimes
   3. $1.00 in change

D. Making change
   1. Start with price of article
   2. Count small coins first
   3. End with amount which was given storekeeper
   4. Example: Article cost 13¢. You gave clerk half-dollar.
      Count change as follows: 13¢, 14¢, 15¢, 25¢,50¢

III. Other Facts Learned

A. Silver dollars
   1. Were used during early history of our country
   2. They were too heavy to carry so dollar bills were made to replace them
   3. They have the same value as dollar bills

B. Comparing prices

C. Courtesy
   1. Children discussed courtesy
   2. Cheerful storekeepers

3. They discussed how one should act as a customer
   a. Sat "thank you"
   b. Do not be impatient if you cannot buy what you want
   c. Be friendly

D. Kinds of stores
1. Grocery stores
2. Furniture stores
3. Clothing stores
4. Book stores
5. Toy stores
6. Music stores
7. Drug stores
8. General stores
9. Hardware stores
10. Department stores

IV. Seatwork

A. Problems
1. Addition
2. Subtraction
3. Gave children an opportunity to develop some speed and accuracy in working problems

B. Chart

cost of article	amount	change
25¢	$1.00	
13¢	.50	
82¢	1.00	

C. Gave children training in concentration on work while there was activity in the room

V. Language

A. Children wrote stories telling about the store
B. Good sentences
C. Capital letters
D. Reports on store
E. Conversation

VI. Art

A. Making pictures showing what store looked like
B. Sign for store
C. Circles for making money
D. Arrangement

VII. Assembly Program

A. Demonstration
B. Short talks by children telling about store
C. Exhibit of pictures, stories, etc.

BIBLIOGRAPHY

1. HOW TO MAKE ARITHMETIC MEANINGFUL. Brueckner and Grossnickle

2. TEACHING THE NEW ARITHMETIC. Wilson, Stone and Dalrymple

3. SOME SUGGESTIONS FOR BUILDING SOCIAL UNITS IN ARITHMETIC. Bulletin of School District of Webster Groves. 1941.

4. ARITHMETIC CURRICULUM (A Survey of a Few Specific Areas in the Arithmetic Curriculum). Bulletin prepared under the direction of Charles E. Garner, University of Minnesota.

5. Manual - ARITHMETIC WE USE. Brueckner, Grossnickle and Merton. Winston Company

THE STORY OF A BOTTLE OF MILK

(Combining Arithmetic and Social Studies)

I. Overview

Milk is a food suitable for everyone, the strong and the weak, the athlete and the sedentary worker. It is the one ideal food for babies, and should be in the diet of every man, woman, and child.

The values of milk are many. It contains all the food elements necessary to healthy living. It combines well with other foods in cooking, and it can be made into butter and cheese. It is digestible, palatable, and economical. If fresh milk is not available, other forms can be used with very satisfactory results.

Furnishing the United States with milk and milk products gives employment to over one million people. Milk is the largest single source of income for the American farmer.

Sixty million of our people depend on others for their milk. New York City alone requires approximately three million quarts of milk a day to feed its people.

The best way to make sure that milk is safe to drink is to pasteurize it. Pasteurization does not affect the taste of milk, or its nutritive value.

Any study of milk should emphasize two phases. The first is the need of ample milk in the diet. The second phase is the production and distribution of milk.

All children know something about milk, but they do not realize its importance in their lives. The story of a bottle of milk gives a starting point for discussions and for new experiences.

The purpose of this unit was to show the children where our school milk comes from, how much milk our room used in a month, and how valuable milk is as a food.

II. Study Guide Questions

A. What kinds of cows are there?
B. How should cows be cared for?
C. How is milk prepared for us to drink?
D. What are some of the products made from milk?
E. What other kinds of milk are used for food?
F. How much milk did our room drink in a month?
G. Why is milk a good food?
H. How can milk help us grow?

III. Unit Outline

A. Types of cows from which we get our milk
   1. Three main breeds
      a. Holstein - the most milk
      b. Jersey - the richest milk
      c. Guernsey

B. Care of cows
   1. Their feed in summer and winter
   2. Keeping them clean
   3. Inspection for tuberculosis

C. Preparation of milk
   1. Strained
   2. Some milk separated
      a. Cream used for butter and ice cream
      b. Skim milk used for food for farm animals
   3. Sent to dairies by trucks or refrigerator cars
   4. Pasteurization - the process
   5. Bottles sterilized
   6. Milk bottled
   7. Delivery to customers

D. Products made from milk
   1. Butter
      a. How it is made
      b. Its use to us
      c. Why it is so expensive now
   2. Cheese
      a. Familiar kinds - American, cream cheese, cottage cheese
   3. Ice cream - how it is made
   4. Condensed and evaporated milk
   5. From casein
      a. High grade coated paper
      b. Many plastic products, such as buttons, buckles, and fountain pens

E. Other kinds of milk used as food
   1. Goats' milk - good for little children
   2. Camels' milk
   3. Reindeer milk

F. Amount of milk drank for lunch in a month
   1. How many gallons would it make
   2. How much did it cost
   3. How could we keep track of it

G. Milk is the most nearly perfect food
   1. It contributes more to good nutrition than any other single food
   2. Milk, fruits, and vegetables are known as protective foods because they supply the dietary deficiencies of other foods

3. Milk costs less than many foods which are of lower food value

H. Milk as a body builder
1. Every growing girl and boy needs to have a quart of milk a day. Everyone over sixteen needs at least a pint of milk a day
2. One quart of milk per day supplies a child's requirements in calcium, and almost completely his requirement in phosphorus. It is an excellent source of vitamin A and vitamin G
3. Calories are heat units by which energy value is measured. One quart of milk contains nearly 700 calories

IV. Exploratory Outlets

A. Creative activities
1. Making of a calendar to show the daily sale of milk in our room
   a. Weekly totaling of milk sold in terms of gallons, quarts, pints, and half pints
   b. Computation of weekly cost of milk used
2. Made health posters showing the value of drinking milk
3. Made up rules for caring for milk in the home and practiced copying them in writing period
4. Played buying and selling milk - using toy money
5. Collected pictures of animals which give milk
6. Made a milk movie by pasting pictures on wrapping paper, which was then rolled on sticks
7. Made a scrapbook of various foods or dishes that contain a great deal of milk
8. Each pupil kept a graph record of the milk he drank for a week to see whether he had the proper amount

B. Visual Aids
1. We used the following flims from the Visual Education Department
   a. Butter
   b. Food and Growth
   c. Milk Parade
   d. Miss Bossie Goes to Town
   e. The Farm
   f. What Makes It Go
   g. Wisconsin Dairies
2. Using half pint, pint, and quart bottles and a measuring cup, we found how many cupfuls there are in each, how many pints in a quart, and how many quarts in a gallon
3. We made butter in class by beating heavy cream with a rotary beater
4. We conducted simple science experiments with milk
   a. We shook an unopened bottle of milk and watched for the cream line to appear after a few hours
   b. We continued to watch the bottle of milk each day until the curds separated from the whey, and discussed the chemical change
   c. We heated the sour milk and made cottage cheese

C. Excursions

1. As a class we visited the St. Louis Dairy, and saw the whole process from the delivery of milk to the plant to the final step of delivery to the customers

D. Exhibits

1. We had an exhibit of our milk posters, scrapbooks, milk-drinking graphs, and pictures of animals who give milk, so that all the pupils of our school might see it
2. We also had a display of pictures from the National Dairy Council and some brought in by the pupils

V. Coordinate Activities

A. Music

1. We learned and sang the following songs
   a. Busy Milkman on page 40 in Merry Music
   b. The Milky Way on page 63 in Merry Music

B. Poetry

1. We memorized a poem called Dolly Drinks Her Milk by Helen Kitchell Evans, which appeared in The Instructor, September 1940

C. Creative Writing

1. We wrote original stories about farms, milk, and our visit to the dairy

VI. Culminating Activities

A. We worked out a play about milk
B. We had an exhibit of the articles and materials used in the unit

VII. Evaluating the Unit

A. Through a number of group activities the children were taught to see what an important part milk plays in their lives

B. They learned about the operation of a modern dairy and the importance of cleanliness in connection with milk

C. They found that milk is a universal food that comes from many animals

D. We endeavored to create the proper attitude toward foods that promote health, and especially to emphasize the food value of milk

E. We constantly encouraged the habit of drinking a glass of milk at every meal

F. As our unit developed the children were able to appreciate the interdependence of the city and the farm

G. The class saw the need of learning more about the arithmetic processes, since so many of them were involved in our unit, especially the use of liquid measure, making change, and using a ruler to make calendars and graphs.

H. We hoped that, after studying this unit, the class would come to see milk as a perfect food.

VIII. Resource References

A. Teachers' References
1. For unit teaching
   a. Breckner and Grossnickle. How To Make Arithmetic Meaningful
   b. Wilson, Stone and Dalrymple. Teaching the New Arithmetic
2. For facts about milk
   a. Carpenter, Frank G. The Foods We Eat.(American Book Co.)
   b. Chamberlain, James F. How We Are Fed. (Macmillan)
   c. The Grade Teacher. Cheese. November 1946
   d. The Instructor. Milk - The Perfect Food. September 1940
   e. The Instructor. The Story of Milk. November 1947

B. Childrens' references
1. Andress, J. M., and Goldberger, I. H. The Health Parade (Ginn and Co.)
2. Beaty, John Y. Story Pictures of Farm Work. (Beckley-Cardy)
3. Dairy Council of St. Louis. The Milk Your Milkman Brings.
4. McIntire, Alta. The Follett Picture Story of Milk. (Follett Publishing Co.)
5. McLester, Amelia. We Look Around Us. Child Activity Readers (Augsburg Publishing Co.)
6. Miller, Jane. Dean and Don at the Dairy. (Houghton-Mifflin)
7. Towse, Anna B. and Matthews, Florence. Health Stories Book Two (Scott Foresman and Co.)
8. Worthington, Josephine and Matthews, Catherine. Our Food. (F. A. Owen Pub. Co.)

GRADE IV

CONCRETE AND VISUAL AIDS

CHAPTER I — WE MEET OUR NUMBER FRIENDS AGAIN
(Manual pp. 149-151)

Pages 2,3	Flash Cards (addition) Counting disks to reestablish understanding of combinations forgotten Pupil-made practice cards for individual practice on combinations not mastered
11	Place Value Pockets (Winston)
13	Place Value Pockets
16-17	Flash Cards (subtraction) Counting disks (See directions for p. 2,3)
18	Place Value Pockets
21	Pupils make pictures to illustrate subtraction Use real coins for problem 2
23	If possible, use this lesson at the time of regular weighing period
25-26	Flash cards (multiplication) Counting disks to reestablish any combinations forgotten Individual pupil-made practice cards
28	Place Value Pockets
23-33	Fractional Parts (Winston)
34	Counting Disks
35	Counting Disks Pupil-made practice cards
36	Place Value Pockets
37	Problem 1 - Use blackboard illustration of 20 words written in 2 columns Problem 2 - Use counting disks Problem 3 - Use a 15" strip of paper or ribbon Problem 4 - Use "make believe" tickets
39	Counting disks
40	Pupil-made pictures for problems
41	Type 1 - Toy money, or real coins Type 2 - Counting Disks
45	Use any of the visual aids necessary in doing this review page

CHAPTER II — THE FOURS. DIVISION WITH REMAINDERS

Page 47	Let children talk about and play some games - to see how numbers are used
48	Place Value Pockets
50	Use some of the ideas suggested by the problems to decorate the room for some particular time, and see how numbers are used in this connection
51	See Manual, p. 160 for further directions for chart on this page

Pages 55 Individual practice cards for drill on division facts of 2 & 3. Tests (for quick testing) as follows:

	÷ 2
10	
2	
8	
0	
12	
6	
16	
4	
14	

Have pupils write numbers divisible by 2 in a column. They begin to write the quotients when the teacher says "ready". They check each others, or their own papers as one child calls the answers. Those missed should be studied individually, or 2 children working together.

Prove answers for Part II with counting disks.

56 Counting disks

57-58 Place Value Pockets, (See Manual, p. 163)

59-61 Place Value Pockets

62 Counting Disks

63 Place Value Pockets (for several examples in each set, in order to be sure each child understands the process)

65 Build up the concept of 1000 by using the entire set of Counting Disks. (There are 1000 in the complete set. By building first, piles of 10's, then groups of 10 tens for hundreds, the concept of 1000 can be made concrete.)

66 Place Value Pockets

67 Place Value Pockets (for the demonstration examples at top of page.)

68 Counting Disks to "see" the new combinations of 4's

70 Large charts made by teacher to illustrate the number pictures suggested. Children make individual number pictures at their desks

71 Pupil-made practice cards as directed

72 Have a large piece of paper measured and cut to represent the piece of cloth in problem 1

79 Place Value Pockets to build concept of multiplying by 4. Use for 2 or 3 examples to demonstrate

90 Place Value Pockets

92 Have children follow suggestion No. 3

CHAPTER III THE FIVES. DOLLARS AND CENTS

98 Place Value Pockets

101 Place Value Pockets

108 Have children bring in pictures with prices of clothing and find cost of a winter outfit for boys and for girls. Let each child figure out total cost of things at price level he can afford to buy

112 Counting Disks to establish the concepts of new multiplcation combinations

113 Pupil-made practice cards. Merry-Go-Round game can be made on large cardboard or blackboard

114 Make pictures - individual and on blackboard to illustrate combinations

Match combinations with reverse combinations

Page 115 Make a Number Ladder on blackboard or chart
116 Toy or real money
118 Place Value Pockets
123 Fractional Parts to check lesson
123 Place Value Pockets
125 Clock face
126 Counting Disks

CHAPTER IV LIQUID MEASURES. DIVIDING MONEY.

136-137 Measures - gal., $\frac{1}{2}$ gal., pt., $\frac{1}{2}$ pt. or milk bottles, gal., $\frac{1}{2}$ gal., pt., $\frac{1}{2}$ pt.
138-139 Measuring cup, gal., qt., pt. Teaspoon and tablespoon
140,142 Place Value Pockets
144 Measures or bottles - gal., qt., pt., cup
147 Use sticks for grouping

CHAPTER V THE SIXES AND SEVENS. TWO-STEP PROBLEMS.

153 Ruler, yardstick
154 Counting Disks, or sticks
155 Pupil made practice cards

Tests:

	X 6
6	
1	
0	
9	
4	
8	
3	
5	
2	
7	

160 Counting Disks
162 Measures - qt., pt., gal.
163 Ruler and yardstick
165 Counting Disks
166 Pupil-made practice cards
170 Counting Disks
Practice Crads
171 Hopscotch game - on board or chart
173 Counting Disks
Practice Cards
175 Counting Disks
176 Make a midget auto race on the board or on a big cardboard
177 Make large shapes of cardboard or colored paper to correspond to those mentioned on this page
178 Counting Disks
184 Have children bring in various stamps. Extend this lesson to develop further knowledge of postal service and costs
194 Use many concrete objects to compare. See Manual p. 172
195 Fractional Parts (Winston)

CHAPTER VI THE EIGHTS. USING LARGER NUMBERS

200	Review subtraction of 3-place numbers, using Place Value Pockets to illustrate. Explain that 4-place numbers can be done that way also, but it is difficult to manage so large a bunch of cards
206	Look up long distance rates in telephone directory
210	Counting Disks
211	Make a criss-cross game on the blackboard Pupil-made practice cards
212	Counting Disks: Pupil-made Practice Cards
215	Measures - bushel and peck
220-221	Make the chart of 5's on board. Toy or real money to make change
222	Clock with second hand. Calendar to review days in week
223	Draw the cookies, or use Counting Disks.
224	Practice cards
225	Copy all of the chart
227	Toy or real money

CHAPTER VII THE NINES. NEW MEASURES

235	Have children bring in other aids. Compute savings
236	Rulers
237	Make a box by specified measurements
238-239	Measures
240	Measure on playground, 1 foot, 1 yard, 1 rod
241	Toy money
242-243	Counting Disks
245	Measure off rectangles, etc. on floor. Measure to find distance around
246	Draw picture, or use Counting Disks. Pupil-made practice cards
247	Make number hoops on board or cardboard
250	Counting Disks; Pupil-made practice cards
252	Counting Disks
255-257	Calendar

CHAPTER VIII WE LEARN TO USE FRACTIONS

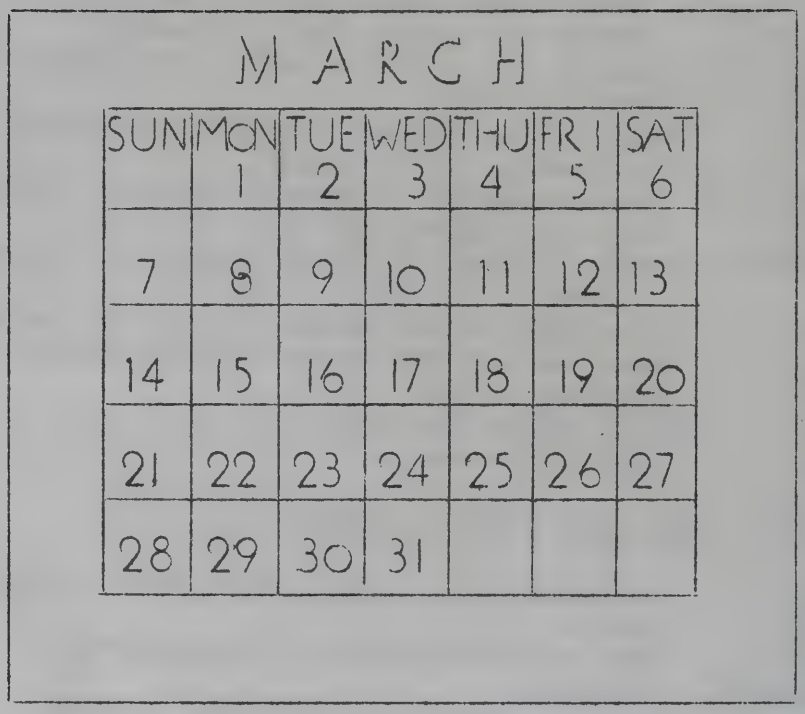
267	Thermometer
271	Counting Disks
272-273	Fractional Parts (Winston)
275	Make a kite by directions given
276	Fractional Parts

The following items are supplementary aids to enrich the children's experiences:

1. Electric combination boards for any of the four processes
2. Weather chart
3. Milk Chart
4. Spelling chart
5. Rapid-Easy Drill Charts for the 4 processes (Manufactured by Cook & Co., 3942 Queen Avenue., North Minneapolis 12, Minnesota)

MAKING A WEATHER CALENDAR

(3rd or 4th Grade)



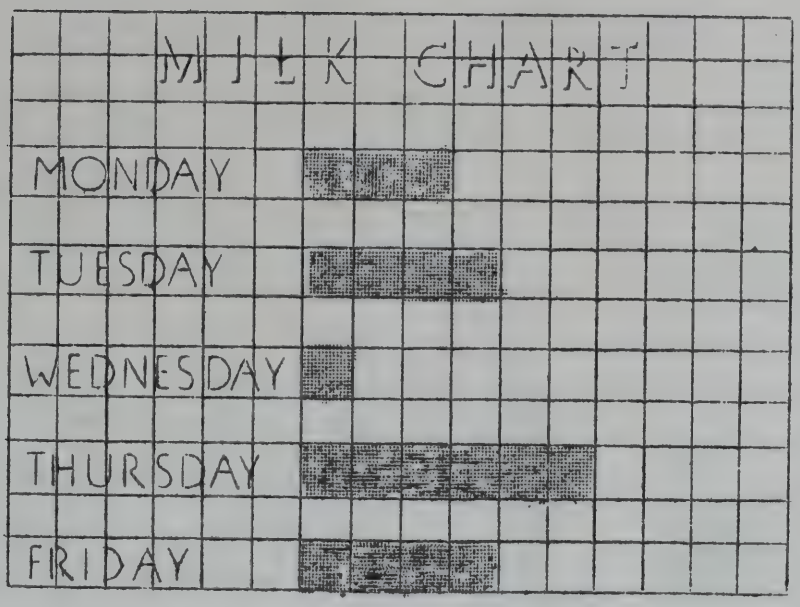
This will combine using a ruler to measure and mark off the days for a calendar, and a review of the days of the week. It will also review counting and summarizing as - the number of sunny days, the number of rainy days, etc.

The children may decorate the border of the calendar with symbols appropriate to the month, and also indicate any special days.

Sunny days may be colored yellow, rainy days shown by a small umbrella, cloudy days may be colored gray, and snowy ones white.

MAKING A MILK CHART

(3rd or 4th Grade)

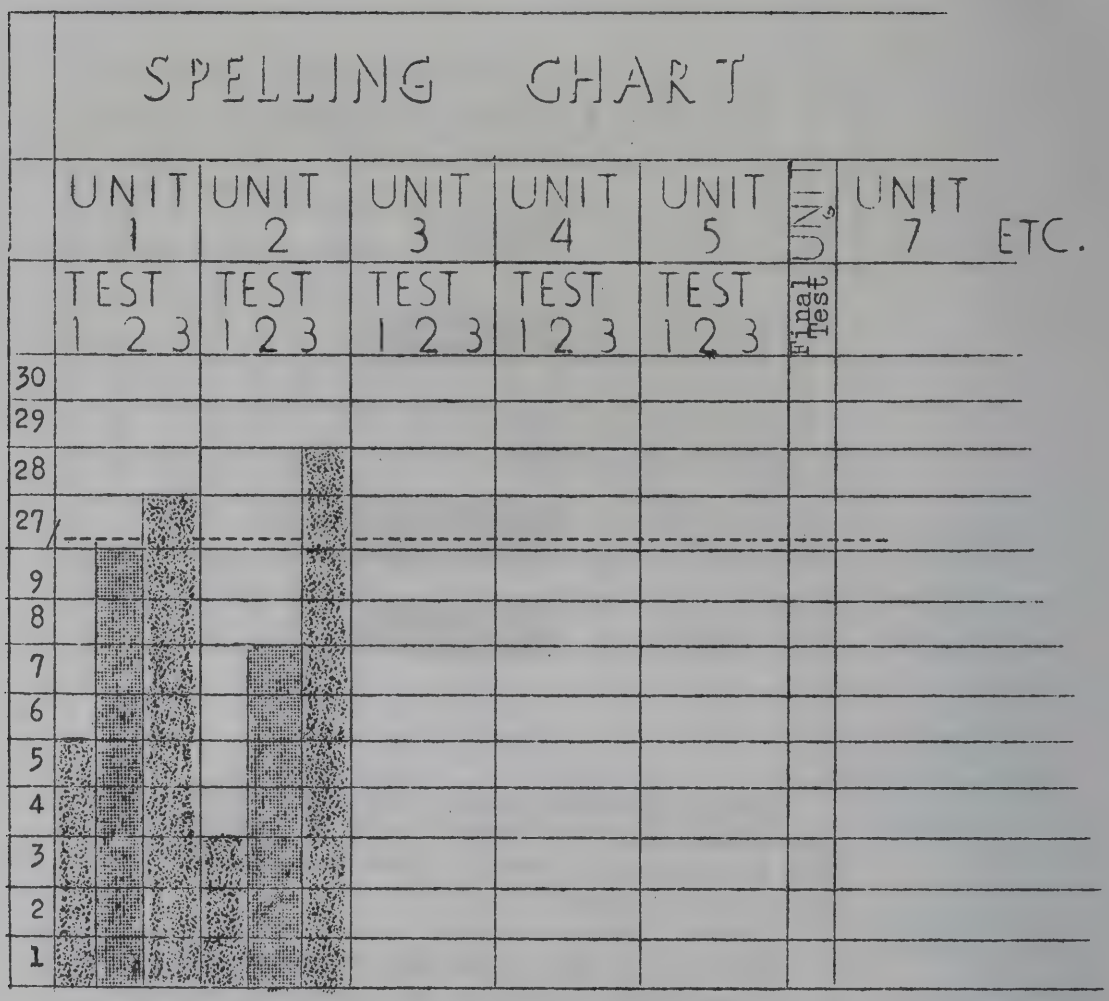


Using blocked paper, have each child make an individual chart to show the number of glasses of milk he drank in a week. Each block will represent one glass of milk.

This is a good exercise to teach the children to follow directions and to count the blocks carefully so that their printing and graphs will be uniform in appearance.

SPELLING CHART

(3rd or 4th Grades)



Use $\frac{1}{2}$" squared manila paper. The columns will be as many squares high as there are pupils in the class. Each square in a column represents a possible perfect score on the designated test. Color a square for each perfect score actually earned. This is a class chart. It will help in developing the ability to read bar graphs.

Individual spelling charts may also be used. For these, each square will represent one word. Color a square for each word correctly spelled. The columns will be as many squares high as there are words to be studied that week.

GRADE IV - SOCIAL UNIT

BOOKS AND SUPPLIES IN A FOURTH GRADE ROOM

I. Overview

The purpose of this unit was to give the children some idea of the cost of books and materials used by our fourth grade class, and to develop an appreciation of the thrifty use of books and materials purchased with tax payers' money.

II. Study Guide Questions

We discussed the value of such a unit of study as this, and agreed upon the following questions to guide our thinking and the work we would do.

A. What is meant by school "supplies"?
B. Which costs more each year, books or supplies?
C. How many years do most books last?
D. Who buys all the things needed?
E. Where does the money come from?
F. How do we know how much material or how many books we need?
G. How much paper does our class use during a school year?

III. Outline of Subject Matter

A. Supplies

We decided to study about supplies first. We used the prices quoted on the budget sheets. Each day during this study, a section of the price list was put on the blackboard, and we worked problems. The problems were made cooperatively, always keeping in mind the idea of finding the cost per pupil, or cost for the entire group; and cost of the year's quota for our group. To find the cost of our quota of supplies, we used the budget requisitions made in January, 1947 for this group for 1947-1948 use.

Since our class numbers 29 we decided to figure all class costs as for 30.

1. Paper we use
   a. Penmanship
      We learned prices of the two kinds of paper we used for written work. We compared them as to usefulness for various kinds of work. We found the cost of the budgeted amount. We figured to find how many sheets we got per penny in the packages of 1 ream each. We learned that this paper is packaged by the ream and each kind has its identifying number. We found total cost of all paper ordered for the year.

b. Art paper
We learned the various kinds - construction, manila, white drawing, finger paint, and squared. We learned sizes - 9" x 12", 12" x 18", and 24" x 36". We learned how to write these sizes. We measured, compared prices and sizes, found the cost of the amount of each size ordered, and the total cost.

c. Other paper items
We learned (or reviewed) the meaning of oak tag board, bristol board, and chip board. We measured sizes, found cost of items ordered, and total cost. We learned that oak tag board and bristol board are bought by the sheet, while chip board comes in bundles of 25 sheets.
We totaled again to find the cost of all paper items ordered for this year.
We learned that the paper we use for murals and other large projects, is called bogus paper, and comes in large rolls weighing several hundred pounds. This was measured for width.

2. Playground supplies
   a. Bats
   b. Soft balls
   c. Health balls 6"
   d. Health balls 9"
   e. Soccer balls
   f. Jumping ropes

This section of work furnished opportunity for more comparison. We compared cost of winter play equipment with spring and fall equipment. We learned that health ball sizes are given in diameters, while soft ball sizes are given in circumferences. Diameter and circumference were not new words, but took on new meanings. Again we totaled costs.

3. Art supplies, other than paper
   a. Crayons
   We learned that crayons also have identifying numbers. They come in different sizes and boxes of different numbers of colors. They can also be purchased in boxes of 1 gross of the same color. These are called "refills". We compared prices and found the cost of supplying our class with refills for this year.
   b. Water color paints
   We found the cost of supplying a class of 30 with new water color paints. We discovered that since water color paints are not used as frequently as crayons, that a box should last several years. Also, where refills are available, it is more economical to buy that way and reuse the metal boxes. Brushes, also, can be bought separately, and are packed in dozens, each size with its identifying number.

c. Finger paints
We found the cost of the two sets ordered. We learned that our finger paints have been purchased in sets of 6 colors, in 2-oz. jars. We reviewed the fact that 16 oz. = 1 lb., and found what part of a pound of paint is in each jar.

d. Paste
We looked at our paste jar and found it marked "1 gallon". We reviewed what we had learned about the number of quarts in a gallon. We decided that our school paste is bought in gallons because we use so much.

4. Other supplies

a. Pencils
We found that Palmer pencils are packed in bundles of 1 dozen with 6 bundles in a box. We found the total number of pencils in a box and found what part of a gross this was. We found the cost of the 9 dozen ordered. We found that 9 dozen would be one and one-half boxes.

b. Pencil sharpener
A pencil sharpener lasts several years if carefully used. We compared to see which costs the school more, the pencil sharpener or a year's supply of pencils.

c. Rulers
These are also bought by the dozen. We found how much it would cost to equip a class of 30 with new Eye Saver rulers. We discussed why Eye Saver rulers are better than ordinary rulers.

d. Scissors
We learned that they cost $9.00 per dozen. So far this is the most expensive item we have studied about. We found the cost of 30 and the cost of one. We decided that scissors should last - and can last - for many years if used carefully. Therefore, although the cost is large at the time of purchase, the cost for a period of years is not as great as it is for a number of other items.

e. Pins
We use pins in many ways. We learned that they are packed in $\frac{1}{2}$ lb. boxes. One box is usually sufficient for a 2 year supply. What part of a pound is needed for a year's supply? What is the cost?

f. Thumb tacks
We found the cost of the two boxes ordered. We learned that they are packed in boxes of 100 each.

g. Paper fasteners (round head)
We learned that these are made in three sizes - 1", $\frac{1}{2}$", and 3/8". We measured these lengths with our rulers. We found the cost of the 3 boxes ordered. We learned that these are packed in boxes of 100 each.

h. Paper clips
We learned that they come in boxes of 100 each. We found the cost of the two boxes ordered. We found the total cost of these "little" and yet, so important, supplies by totaling costs of items, e,f,g, and h.

We checked over our list and found that there were many more items that we had not worked with. We came to the conclusion that if our room used the supplies we have been talking about, that it was reasonable to suppose that each of the other classes used supplies costing approximately the same amount. This would be a large amount of money for Goodall's supplies.

B. Books

We used the prices as given in the "Handbook", and as given in the January 1948 "Partial List of Instructional Material", and a few others we were able to discover. The following was placed on the blackboard:

Times and Places	$.84
Think and Do for Times and Places	.24
If I Were Going	.75
Model Handwriting	.08
Teachers Manual for M. Handwriting	.25
Blackboard Wall Strips	.40
Webster Speller, Gr. 4	.42
Spelling Tablet	.12
Gaining Skill with Words	.75
Geography Around the World	1.14
Science-How and Why Club	.78
Arithmetic We Use, Gr. 4	.63
Health-Safe and Sound	1.16
Today and Tomorrow	.86
Thorndike Beginning Dictionary	1.35
Music - American Singer	.95
Music - New Music Horizons	.87
My Weekly Reader	.40
Health Shield	.02
Library Books	15.00

This price list stimulated much discussion. Some books seemed high in price while others seemed low. We wondered why "Times and Places" should cost less than "Safe and Sound" although it is a much thicker book.

From this price list we made many problems. We compared costs. We found . , the cost of books in various subject areas - as all reading books, all music books, etc. Finally, we found the cost of all books and instructional materials provided for one child. We multiplied by 30 to find the cost for our class. This brought out the question "Does the teacher's edition of a book cost more, since it contains so many more pages?"

We selected items which are replaced annually, and found four. We found the cost of these, and realized that this amount is a yearly expenditure. Here we learned the meaning of the word "annually."

We looked up the publication dates in books, and found some old and some new. We found the cost of the new sets of books we had received this year.

We discussed the "life" of the various books. We decided that books which receive daily usage, such as arithmetic, spelling, and reading text books, can't be expected to last as many years as supplementary books which are not used every day. We found, too, that some books last longer in spite of daily usage. We decided that these must be of better quality of material, or better workmanship, or perhaps both. We looked carefully at some of our new books and tried to predict their "life".

We discussed the fact that the Board of Education must always plan thoughtfully so that there is money available for new books when they are needed. Replacements are made as books are worn out or become out dated. We discussed the great responsibility which rests on the members of the Board of Education in spending wisely the money entrusted to their care by the taxpayers of a community.

IV. Exploratory Outlets

A. We saw two films
   1. A World of Paper
   2. Reforestation of Waste Lands

V. Coordinate Activities

We made a chart to record the amount of paper purchased by the class during a school month. The chart recorded the amount of money spent and the number of sheets of paper in each tablet or package bought. At the end of each week we totaled individual and class expenditures. Totaling the number of sheets received for money spent during the month provided an excellent opportunity to make comparisons. It answered a question presented early in our unit study "which would be more economical - to buy paper individually in tablet form, or collectively in ream-size packages".

VI. Evaluation of the Unit

A. From the teacher's standpoint, the unit was worthwhile because it provided opportunities for:
   1. Practicing basic skills already learned
   2. Learning new skills
   3. Using judgment
   4. Comparing prices
   5. Writing price lists
   6. Using price lists to work problems
   7. Learning additional vocabulary
   8. Learning new methods of measuring (as counting sheets of paper)
   9. Becoming more aware of the tremendous cost of school supplies, and increasing their feeling of responsibility in caring for and using their books and supplies carefully.

B. From the pupils' standpoint, the unit was worthwhile because it provided opportunities for learning:

1. New words
   a. ream
   b. gross
   c. dozen (added meanings, as applied to school items bought by dozen)
   d. diameter
   e. circumference (not new, but with added meanings)
   f. bundle (as for chipboard)
   g. quota

2. That books purchased in school quantities cost less per book than books bought singly.

3. That different items on the supply list are bought in different ways.

4. That books are purchased from many different companies.

5. That in order to keep an adequate supply of paper for our country, we must reforest our waste lands because the paper supply depends so greatly on the supply of wood pulp.

Bibliography

1. This Is Arithmetic - Bulletin of Association for Childhood Education - 1945

2. Some Suggestions for Building Social Units in Arithmetic - Bulletin of School District of Webster Groves, 1941

3. Arithmetic Curriculum (A Survey of a Few Specific Areas in the Arithmetic Curriculum). Bulletin prepared under the direction of Charles E. Garner, University of Minnesota

4. Meaning Approach to Fractions. Bulletin by Elda L. Merton of the Winston Company

5. How To Make Arithmetic Meaningful. Brueckner and Grossnickle.

6. Teaching the New Arithmetic. Wilson, Stone and Dalrymple

7. Manual for Arithmetic We Use. Brueckner, Grossnickle and Merton. John C. Winston Company

CURTAINS FOR ROOM NINE

The purpose of this unit was to develop a clearer understanding of Arithmetic concepts that were being taught, and to show the need for their practical application in the activities of the childrens' daily living.

The activities in which the children engaged were used to develop a better understanding of the value of money and to instill a deeper appreciation of the value of budgeting and saving. Much practical experience was given in using various types of measurement.

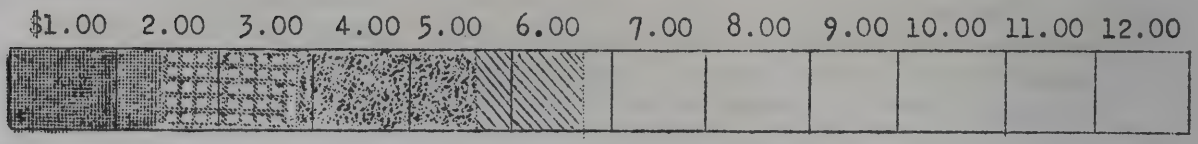
This unit provided more opportunities for arithmetic than any other subject matter field, but many opportunities for the development of skills in oral and written language, reading, and fine arts, presented themselves.

Outline of Subject Matter

A. Introduction
   1. Ways of improving the room discussed
      a. Book ends, bright flower pots, magazine racks, mirror, curtains
   2. Cost of improvements listed
      a. Committees appointed to collect information and report on price of book ends, flower pots, paint, sand paper, brushes, various types of cloth, wire, curtain rods, mirrors
      b. Suggested improvements narrowed to curtains for the room because of expense

B. Planning the curtains
   1. Type of material to be used
      a. Committees appointed to report on other rooms' curtains - material, cost, yardage, sources
      b. Interviews with mothers
      c. Reading newspaper advertisements
      d. Committees appointed to consult dry goods stores
      e. Unbleached muslin chosen
   2. Amouht of material needed
      a. Types of measuring devices illustrated and discussed (foot ruler, yard stick, cloth and steel tapes)
         1. Advantages and disadvantages of each (Steel tape more accurate)
      b. Windows measured and amount of cloth needed determined
         1. Allowances made for heading, hemming, and gathering (4 in. allowed for hemming and heading, $1\frac{1}{2}$ times length allowed for gathering)
         2. Total number of feet needed determined
         3. Feet were converted to yards (Cheapest material came only in 20 yard lots, so 20 yards were to be ordered from Montgomery, Ward and Company, Kansas City, Missouri)

3. Budgeting
   a. Source of money
      1. Room fund (each child had earlier contributed 50¢ from earnings or allowances for parties, etc.
   b. Amount available for curtains
      1. Graph made to show expenditures (put on board as budget was made)


$1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00
Halloween Party
Valentine's Day
Christmas Tree Decorations
Estimated Easter expenses

2. Budget made

Halloween	Food	$1.25
	Napkins	.15
		$1.40
Christmas	Tree	$1.25
	Napkins	.25
		1.50
Valentines Day	Food	$1.50
	Napkins	.20
		$1.70
Estimated Easter Expenses	Dye	$ .20
	Eggs	.82
		$1.02

Halloween	$1.40
Christmas	1.50
Valentine	1.70
Easter	1.02
Total expense	$ 5.62
Amount Available	12.00
Balance	6.38

4. Ordering
   a. Vocabulary explained

pattern	pounds	freight	finish
ounces	parcel post	width	sales tax
express	quantity	amount	check
shipping weight	total	bank draft	postal money order
Express money order		cashier's check	
C.O.D.		R.F.D.	

b. Practice in writing addresses
c. Practice in figuring amounts, writing checks
d. Practice in figuring pounds and ounces in different mailing zones
e. Committee reports on parcel post, express, freight, bank drafts, postal money orders, sales tax, C.O.D.
f. Practice filling in order blanks
g. Making order blanks
h. Methods of sending money discussed
   1. check, bank draft, postal order, C.O.D.
   2. Price of each discussed
      (a) Postal order fees:
          $.01 to $2.50 - 6¢
          2.51 to 5.00 - 8¢
          5.01 to 10.00 - 11¢
      (b) C.O.D.
          $.01 to $2.50 - 15¢
          2.51 to 5.00 - 20¢
i. Order blank filled out and mailed

C. Making the curtains
1. Measured cloth
2. Bought thread
3. Planned designs
4. Bought rods, wire, hooks
5. Kept accounts
6. Bought stencils
7. Planned method of hanging curtains
8. Figured amount of cloth left
9. Decorated bookcase with left over cloth
10. Planned bookcase design
11. Hung bookcase curtains
12. Figured total cost

Material including postage	$4.22
Stencil	.50
Thread	.15
Rods	1.02
Wire	.20
Hooks	.20
	6.29
Amount available	6.38
Left in account	.09

Materials used:
1. Tape measure
2. Yard stick
3. Foot ruler
4. Charts of mailing zones
5. Graphs of money spent
6. C.O.D. fee charts
7. Sample orders
8. Checks
9. Pictures of bank drafts, money order
10. Maps
   a. Used to figure distances and postage due
   b. Central U. S. showing mailing zones

11. Schedule of collections on mail box
12. Talk by railroad employee on freight,parcel post
13. Budgets
14. Advertisements
15. Books
    a. World Book
    b. Text book
        pp. 236,237 measuring
        pp. 92,104,220,221,227 making change and writing numbers
        pp. 116,117 multiplication involving money
        pp. 107 subtraction involving money
        pp. 140,141,142,143,241 division involving money
        pp. 108,111,172,221 Problems

An excursion to the post office would be desirable, but the Webster Groves Post Office does not permit it.

16. Scales

Culminating Activity

Open house for other rooms
Open house for parents

Bibliography

Magazines

Brownell, W. A., "The Place of Meaning in the Teaching of Arithmetic" Elementary School Journal Vol. 40 (January 1947) pp. 256-265
Henderson, Kenneth B., "Weaknesses in Arithmetic Teaching", Elementary School Journal Vol. 40 (June 1946) pp. 579-581
Hill, F. C., "Suggestions for Efficiency in Teaching Arithmetic", Mathematics Teacher Vol. 39 (November 1946) pp. 332-335
McSwain, E. T., "Functional Program in Arithmetic", Elementary School Journal, Vol. 47 (March 1947) pp. 380-384
Tilton, J. W., "Individualized and Meaningful Instruction in Arithmetic", Journal of Educational Psychology. Vol. 38 (February 1947) pp.83-88
Wilson, M. B., "Arithmetic Comes Alive", Instructor Vol. 55 (October 1946) pp. 36-42

Yearbook

Buckingham, B. R., Informational Arithmetic, 10th Yearbook, National Council of Teachers, Bureau of Publications, Teachers College, Columbia University, New York, 1941. pp. 51-74

Books

Grossnickle. How To Make Arithmetic Meaningful.
Morton, Robert Lee. Teaching Arithmetic in the Elementary School. II. Silver Burdett Company, Chicago, Illinois, 1937 pp. 281-321

EXPERIENCE UNIT - GRADE IV

POP-CORN SALE

I. Overview

Giving an entertainment for their parents is something that all children enjoy. For some time this group had been asking if they could give a party for their mothers. For such a party refreshments and favors would be needed. After different means of raising money were suggested, it was finally decided to hold a pop corn sale.

Several children were asked to bring an electric corn popper. Each child explained how corn was popped in his own home. Then came these questions: Pupil, "Where are we going to buy the corn?" Another pupil, "My dada can get the corn at wholesale price". Many other significant questions were asked.

After much discussion it was decided to make a trip to the grocery store to buy shortening, salt, and bags for the first day of the sale. In order to make a good profit, the children volunteered to donate shortening and bags for the remaining days of the sale.

To have a nice party the children decided about six dollars would be adequate. To make a profit of six dollars two things had to be decided: namely: how much profit should be made per bag, and then, how many bags of corn would have to be sold.

The first day of the sale was an experiment to see how much corn we could sell at a cost of five cents per bag. This sale resulted in a deficit of fifteen cents. (One very alert little boy remarked, "All of this work, and here we are in the hole fifteen cents!"). The children decided we could do one of two things, either raise the price per bag or give less corn for the same price. It was brought out in a group discussion that if we raised the price per bag, sales might decline. It was decided to sell one pint for five cents or one quart for ten cents. We sold on this basis for two days and exceeded our anticipated profit.

The unit provided many opportunities for the practice of basic skills in arithmetic, reading, language, and art. The activity promoted valuable experience for the children in working together on problems of concern to themselves.

II. Outline of Subject Matter

A. Purpose or objectives of the project.
   1. The aim of the pop-corn project was to give the pupils an opportunity to earn their own money
   2. To provide an experience which would make pupils feel that they are actually a part of the environment they are creating
   3. To develop within the children a sense of responsibility
   4. To present to the children an experience in buying, measuring, selling, etc.

a. Knowing how much to sell in order not to lose money
b. Knowing not to pay too much for corn and shortening in order to make a profit

5. To develop speed and accuracy in the use of arithmetic skills
   a. Making change
   b. Being accurate in checking daily sales
   c. Checking bags of corn sold against cash received
6. Develop neatness of work - by having the child who has his class problems the neatest, put the records in the record book
7. To develop resourcefulness on the part of children
   a. In locating corn poppers
   b. Having children to investigate where corn, shortening, and bags could be purchased at a minimum cost
   c. Solving problems regarding the selling price of corn
8. To build up attitudes of serving others
9. To develop an appreciation of the work of others

III. Unit Outline

A. Division of study

1. Engaging in the opo-corn activity presented many opportunities for the use of subject matter
   a. Much skill in arithmetic computation was needed
   b. Children gained facility in solving reasoning problems, such as the following:
      (1) Tuesday, we used 14 cans of corn. How much did the corn cost at 15¢ per can?
      (2) One day we took in $6.65. Our expenses were $2.18. Did we lose money or did we gain? How much?
   c. Pupils were given real experience in keeping records of the sale
      (1) Record of sales for February 23, 1948
         (a) Total sales - 29 bags of corn @ 5¢ = $1.45

Pennies	$0.25
Nickels	.55
Dimes	.40
Quarters	.25

         (b) Expenses: - $1.60

Shortening	$0.25
Salt	.07
Paper bags	.30
6½ cans corn @ 15¢	.98

(c)	Expenses	$1.60
	Cash received	1.45
	Loss	0.15
(d)	Donations	0.25
(e)	Cash received sale	1.45
		$1.70
(f)	Minus expenses	1.60
(g)	Cash on hand	0.10

(2) Record of sales for February 24, 1948

(a) Total sales - 139 bags of corn @ 5¢ - $6.65

Pennies -		$0.65
Nickels -	34	1.70
Dimes -	18	1.80
Quarters	4	1.00
Half-Dollars	1	.50
Bills		1.00

(b) Cash on hand 0.10

Total $6.75

(c) Expenses:
14 cans of corn @ 15¢ - $2.10

(d) Total sales
minus expenses 4.65

(3) Record of sales for February 25, 1948

(a) Total sales - 70 bags of corn @ 5¢ - $3.50

Pennies		$0.15
Nickels	20	1.00
Dimes	6	0.60
Quarters	3	0.75
Halves	2	1.00

(b) Cash on hand 4.65

(c) Donations 1.70

(d) Total of a,b,c 9.85

(e) Expenses:
9 cans of corn @ 15¢ - $1.35

(f) Profit 8.50

B. Division of work:
1. When working out details of the sale, the children began to realize there were many things to be considered. The children decided upon the following committees:
   a. Arranging the furniture
   b. Popping the corn
   c. Bagging the corn
   d. Selling
   e. Washing the dishes
   f. Cleaning up

IV. Activities During Unit

A. Problem solving activities
1. Raised questions such as those listed previously
2. Presented reports and results of investigations
3. Discussed the information presented

B. Construction and concrete experiences
   1. Examined corn poppers
      a. Compared different kind
   2. Timed corn while it was popping

C. Appreciation activities
   1. Read numerous stories about corn
   2. Told stories about uses of corn

D. Creative activities
   1. Made posters advertising our sale
      a. Example:

POP - CORN

TUESDAY - WEDNESDAY

Room 104

Pt. 5¢ Qt. 10¢

E. Excursions
   1. Visited grocery store

V. Materials Used

A. The following objects were used while carrying on this unit
   1. Four corn poppers
   2. Two one pint measuring cups
   3. Two one quart measuring cups
   4. Six large spoons
   5. Four large pans
   6. Clock
   7. Paper bags
   8. Paper towels
   9. Mats
   10. Dish cloths and tea towels

B. Books and printed materials:
   1. Library books
   2. Numerous stories in reading textbooks, social studies readers, etc.

C. Visual Aids
   1. Slides, pictures

VI. Culminating Activity of the Unit

A. Party for the mothers
   1. A report on our sale was read
   2. Miscellaneous program was given

VII. Possibilities

A. This activity is rich in subject matter
   1. Dramatize several episodes from the history of corn
   2. Prepare an exhibit
   3. Display a frieze, "The History of Corn" set up as a motion picture
      a. Explain each scene on the frieze
   4. Write original compositions
   5. Put on a short play written by the children - "The First Grain of Corn"

VIII. Evaluating the Unit

The outcome of this unit was rich and stimulating. Children like to plan such an entertainment themselves, and one activity they would most likely suggest would be giving a party for their mothers. The children had many meaningful experiences with the uses of numbers in a social enterprise. They learned through direct contact much valuable information about making change, measuring, comparing amounts, counting and reading numbers, and using number operations. The need of careful work was encouraged by the fact that each day there was a check to show that their work was correct.

In this unit both the mathematical and social phases of arithmetic were emphasized. The activity was correlated closely with the regular curriculum, and gave many valuable experiences, not only in arithmetic, but also in other areas, such as reading, language, and art.

References

Betzner, Brownell, et al. THIS IS ARITHMETIC - Bulletin of the Association for Childhood Education (1945)

Brueckner-Grossnickle. ARITHMETIC MEANINGFUL. John C. Winston Company (1947)

Morton. TEACHING ARITHMETIC IN THE PRIMARY GRADES. Silver Burdett and Company (1927)

Wilson, Stone and Dalrymple. TEACHING THE NEW ARITHMETIC. McGraw Hill Book Company, Inc. (1939)

GRADE V

CONCRETE AND VISUAL AIDS

I. Problem Solving

A. Oral discussion of many written problems
B. Many original problems made by the pupils
C. Use life situations to develop one, two, and three step problems

II. Computation

A. Addition and subtraction
1. Use problem solving
2. Develop skill and speed
a. drill games
b. circle games
c. climbing ladder

B. Multiplication and Division
1. Use two place numbers in multiplication
a. Problems using life situations as - cost of school supplies and school furniture
2. Division
Problems using life situations

C. Finding averages
1. Use health charts for finding average height and weight of girls and boys in class
2. Spelling charts for average score
3. Temperature records

III. Fractions

A. A concept of fractions
Fold, cut, or shade paper

B. Adding and subtracting like fractions
Fold, cut, or shade paper
Use recipes doubling amount

C. Changes to lowest terms
Make fraction chart
Use wall chart

IV. Measurements

A. Linear measure
Use ruler, yard stick
Much experience in measuring as: desk, door, blackboard, dimensions of the room

B. Square measure
Use ruler, yard stick, rod length wire. Much experience in finding area

C. Time
Use clock, calendar, standard time belt charts

D. Liquid measure
Use gallon, quart, and pint containers

E. Dry measure
Use bushel, peck, quart, and pint containers

V. Roman Numerals
Use historical dates, chapter numbers, some clocks, corner stones on some buildings

VI. Reading and Writing Large Numbers

Use newspaper articles, school publications

VII. Simple Decimals

For reading decimals use speedometer on cars, measuring the rainfall, cost of gas per gallon

SOCIAL UNIT - GRADE V

"HOW WE GOT WEIGHTS AND MEASURES"

I. Overview

The purpose of the unit was to make the standard measures meaningful to the children.

Through a variety of group activities, the children were led to see that everything about us is measured in some way as the things we eat and wear, the land we live on, the fuel we burn, the days, the rain, and the wind. They also saw the need of legal standards of measure to secure uniform practice, both nationally and internationally, and the need of varying sizes of units to increase precision.

II. Outline of Subject Matter

The problems considered by the class:

A. History of many measures used
   1. How distance was measured as cubits, span, digit, hand, pace, yard
   2. How land was measured as the amount of land oxen could plow in a day
   3. How man began weighing things as with a stick hanging by a cord tied around the middle
   4. The use of the first coins by the ancient Greeks

B. The work of the National Bureau of Standards
   1. Location of the Bureau
   2. The number of people who work there
   3. The laboratories and workshops where people are working with weights and measures
   4. The different kinds of testing machines in the laboratories

C. Problem solving
   Problems on linear measure, area, weights, liquid and dry measure, value, and time
   Many problems were questions raised by the pupils and some were suggested by the teacher to bring certain facts before the class

III. Activities During the Unit

A. Oral reports given on early ways of measuring distance, value, capacity, counting, and some funny measures

B. Concrete experiences
   The pupils experimented with some of the old measures as pace and foot. Several children measured the size of their baseball diamond in paces and compared the result with the actual measurement. They measured the distance across the room by having several pupils find how many times they would have to place their feet end to end and compared this with the true foot measure.

The children estimated the length of objects in the class room as width of door, length of blackboard, width of desk, and length of room. Then they measured these objects and found the difference between true measure and their estimation.

They kept a chart of various measures they used in the home for a week.

Original problems as:

a. several children who were making a garden brought problems to class on perimeter.
How much will be needed to put around my garden plot to keep out the rabbits and how many posts will I need?

b. Another problem on area.
How much grass seed will we need for the yard?

c. One problem was finding the cost of replacing pane of glass in a garage window broken while playing ball.

d. There were many problems on time belts in the United States and the difference in time in the important cities of the United States.

Health charts were used to find the average height and average weight of boys and girls of the class.

They used their geography to compare area of states and practiced reading large numbers.

IV. Evaluation

Many problems about weights and measures provided practice in developing skill in problem solving. The original problems prepared by pupils, growing out of home situations, were valuable ways to develop in the pupils the ability to understand the measurements used in every day life.

There was practice in locating material in making reports and practice in using reference material in giving reports.

They had much practice in using number skills and met many new words to increase their vocabulary as: area, perimeter, rectangle, dimensions, estimate and approximate

References

How Much and How Many. Joanne Bendick. Whittlesey House. New York.
Time Keeping Through the Ages. National Bureau of Standards, Department of Commerce
Time Zone Maps of the U.S. (10¢). Miscellaneous Paper No. 111 National Bureau of Standards
Units and Systems of Weights and Measures. National Bureau of Standards. Department of Commerce
World Book

GRADE VI

CONCRETE AND VISUAL AIDS

1. Fractions - addition and subtraction of unlike fractions, multiplication, and division
   a. Fraction wall chart - John C. Winston Co., Philadelphia
   b. Enlarged fractional parts - J. C. Winston Co., Philadelphia
   c. Shaded circles and rectangles
   d. Rulers
   e. Pictures
   f. Squared paper
   g. Crayons
   h. Scissors
   i. Maps
   j. Graphs (circle and bar)
   k. Scale drawings
   l. Scales
   m. Music
   n. Recipes
   o. Purchases
   p. Sewing

2. Decimals - reading, writing, addition, subtraction, multiplication, and division

   a. Place Value Pockets - John C. Winston Co., Philadelphia
   b. Place value charts
   c. Shaded circles and rectangles
   d. Money
   e. Speedometer readings
   f. Squared paper
   g. Ruler
   h. Graphs
   i. Baseball and weather charts
   j. Newspaper statistics, such as large numbers, sport records, speed records, prices, etc.

3. Measuring - linear, square, cubic, time, dry, liquid, and weight

   a. Rulers (foot and yard)
   b. Tape for measuring land
   c. Squared paper
   d. Maps drawn to scale
   e. Pictures
   f. Scale models and drawings
   g. Ball diamonds
   h. One inch cubes
   i. Boxes of even dimensions such as 2 cu. in.; 1 cu. ft.,
   j. Clock
   k. Calendar
   l. Time tables
   m. Time lines
   n. Dry measure containers; such as pint, quart, peck, etc.

o. Liquid measure containers, such as pint, pint, gallon
p. Recipes
q. Scales
r. Graphs

4. Business Applications

a. Bills
b. Checks
c. Deposit slips
d. Bank statements
e. Sales slips
f. Receipts
g. Account forms
h. Budget outlines

5. Graphs - bar, circle, line and picture

a. Samples of each graph
b. Squared paper
c. Crayons
d. Rulers

EXPERIENCE UNIT - GRADE VI

PUBLISHING SCHOOL PAPER

I. Overview

The sixth grade groups of Bristol School have charge of publishing the school paper; Bristol Life. This unit gives to each group of children an opportunity to supervise a project resulting from the combined efforts of the entire school. The children also gain some understanding of the problems involved in publishing a newspaper. Through group and individual activities, the children outline plans for content, collection of materials, printing and selling the paper. They have the experience of devising methods for carrying out the plans.

This unit correlates oral and written English, and with the mathematical and social phases of arithmetic. Solving the problems which arise during the printing and sale of the paper, provide an incentive for learning and practicing basic skills in arithmetic. It also helps to develop reasoning ability. An experience unit of this kind helps children to understand and appreciate the practical application of arithmetic in solving their own problems.

The unit gives to the children the experience of working together for a common goal and evaluating their own work.

Concomitant Arithmetic

1. Decide on number of pages to be used in the publication.
2. Space to be devoted to each article.
3. Number of words per column inch, single or double space mimeographed.
4. Length of stencil line.
   Length of column line.
5. Size of column drawings to balance in stencil column.
6. Number of reams of paper necessary to publish the paper for a semester.
7. Cost of stencils for a semester.
8. Estimate number of copies per issue.
9. Unit cost per copy.
10. Selling price per copy.
11. Making change.
12. Keeping records
13. Paying bills
14. Laying out block prints.

II. Outline of Subject Matter

a. Determine policies of the paper
   1. Individual listing of things to be accomplished
   2. Group discussion of items listed
   3. Selection and writing of following policies:

a. Have all groups represented in the paper
b. Tell of activities of the school
c. Publish articles all the school will enjoy
d. Encourage good writing, English, and spelling
e. Tell ways in which we can improve our school
f. Print school news
g. Print articles, poems, and stories to help make us friendly toward others

b. Choosing staff members and outlining their duties
1. Group discussion rrsulting in the following staff
(a) editor
(b) assistant editor
(c) art editor
(e) circulation manager
(f) treasurer
(g) printer
(h) assistant printer

Circulation manager
1. Supervises selling committees
2. Advertise paper
3. Keep accounts of papers printed and distributed for selling
4. Keep records of sales
5. Make records for office files
6. Make suggestions concerning ways of selling papers

Treasurer
1. Take charge of money
2. Check money with number of papers sold
3. Count money
4. Pay any bills
5. Turn money to office

Printers
1. Run the mineograph
2. Follow directions
3. Work independently
4. Keep record of papers printed
5. Supervise printing committee

Writing of following articles for one issue of paper by members of the group
1. Editorial
2. Sports Tournaments
3. Art Museum Trips
4. Paper Drive for Treasure Chests
5. Red Cross News
6. Polio Drive "March of Dimes"
7. Fire Drills
8. Cafeteria Suggestions
9. Patrol News
10. School Improvements
11. Assemblies
12. New Stop Signs

13. High School Gymnasium
14. Clare Tree Major Plays
15. Bird Feeder

Assembling of paper
1. Selection of materials to be used
2. Arrangement of material in an interesting and attractive way

Planning Sale of paper
1. Advertising the sale
   a. Make written and oral announcements
   b. Make and distribute posters
2. Increasing circulation
   a. Arouse interest by contests, such as cover picture
   b. Try various methods of selling paper
      (1) Newsboys
      (2) News stand
      (3) Group orders
   c. Make paper more attractive
      (1) Block print cover
      (2) Use more illustrations

Printing paper
1. Cutting art stencils
2. Running mimeograph
3. Assembling and clipping pages together
4. Counting papers
5. Distributing papers for sale

Sale of paper
1. Keeping accurate accounts
2. Making change
3. Counting money
4. Borrowing money

Reasons for Loss
1. Careless printing caused waste of paper and stencils
2. Higher cost of paper and stencils
3. Careless assembling resulting in reclipping caused waste of time and effort

III. Activities during the unit

A. Problem solving activities
1. Formulating of following problems by group during work on unit
   a. What makes a good paper
   b. Why was the price raised from 2¢ to 3¢ last year
   c. Can we still pay expenses by selling the paper for 3¢ this year
   d. How can production costs be kept down
   e. Is it better to have a large paper with articles from more people and raise the price, or is it better to print a smaller paper to sell at the present price
   f. How can the paper be made more interesting to all the children of the school

g. Which way of selling is more economical of time and effort
h. What arithmetic do we need to know to publish the paper

B. Creative Activities
1. Writing and making announcements
2. Writing and illustrating articles for the paper
3. Making design for cover page
4. Designing and making advertising posters
5. Planning policies of paper and determining duties of staff members

C. Appreciation Activities
1. Examining other school papers
2. Choosing materials to be printed
3. Evaluating and judging merits of own work and effort
4. Learning new words and terms

D. Concrete and Constructive Activities
1. Laying out and cutting block print
2. Printing cover page from block print
3. Cutting art stencils
4. Running the mimeograph
5. Assembling and clipping pages of paper together
6. Selling paper

E. Practice to develop skills
1. Keeping accounts
a. Multiplication
(1) whole numbers
(2) fractions
(3) decimals
b. Addition
c. Subtraction
2. Borrowing money
a. Per cent
b. Interest
3. Business forms
a. Promissory note
b. Check
c. Receipt
4. Vocabulary
a. New words and signs
(1) Stencil
(2) Ream
(3) Promissory note
(4) Interest
(5) Endorse
(6) Per annum
(7) Per cent
(8) %
(9) @
(10) Of meaning X

IV. Outcomes of the Unit

A. Increased respect for the opinions and contributions of others.

B. Realization of the value of using resources of various departments of the school in doing a unit of work.

C. Assumption of personal responsibility for one's share of the work.

D. Learning to work with a group for a common goal.

E. Ability to discuss problems objectively and make impartial decisions.

F. Satisfaction derives from work well done.

G. Increased skill in arithmetical processes.

H. Strong motivation for learning new skills.in arithmetic.

I. Greater reasoning ability.

J. Two issues of the school paper.

EXPERIENCE UNIT - GRADE VI

SCHOOL GROUNDS SURVEY

As one phase of an experience unit in sixth grade arithmetic we decided to determine the area of our playground space at Goodall. A committee of three measured the dimensions during noon hour one day. Then the class figured the area in square feet and also in acres. Next we drew the three separate plots according to scale.

On a large chart we sketched the school building and playground area. The upper playground was 278' x 193' which equalled 53,654 square feet area. As to scale we let 1 square equal 10 feet. The tennis court section was 200' x 118' which gave an area of 23,600 square feet. According to the scale 1 square represented 5 feet. The dimensions of the lower playground were 200' x 200' making the area 40,000 square feet. According to scale 1 square was equal to 10 feet. We then found the total area by adding

53,654	square	feet
23,600	"	"
40,000	"	"
117,254	"	"

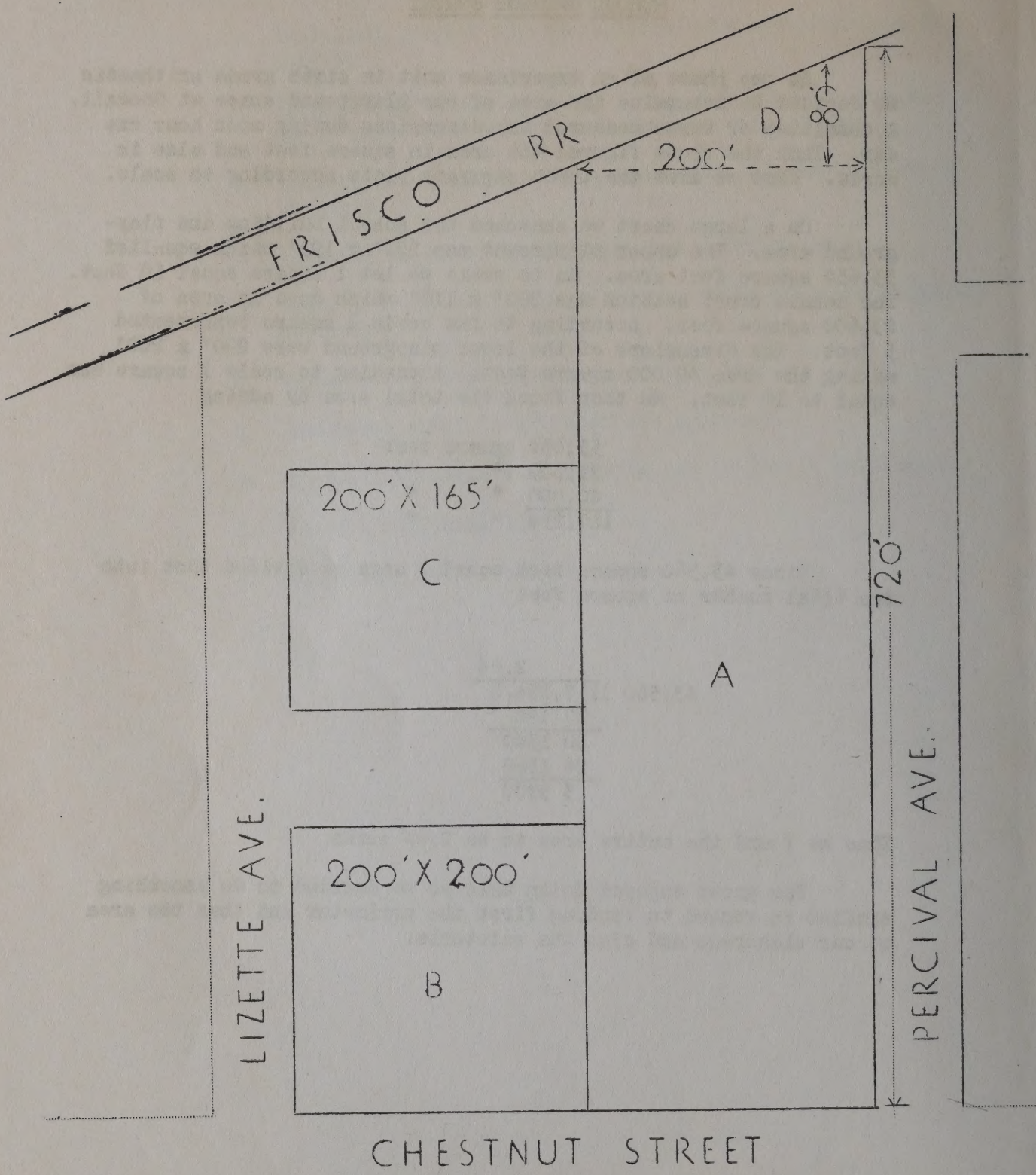
Since 43,560 square feet equal 1 acre we divided that into the total number of square feet

$$
\begin{array}{r}
2.6\not4 \\
43{,}560\overline{)\,117{,}254.0} \\
87\ 120 \\
\hline
30\ 1340 \\
26\ 1360 \\
\hline
3\ 9980
\end{array}
$$

Thus we found the entire area to be 2.6$\not4$ acres

The group enjoyed doing this so we decided to do something similar in regard to finding first the perimeter and then the area of our classroom and also the cafeteria.

GOODALL



A	126,000
B	40,000
C	33,000
D	8,000
Total Area	207,000

How many acres equal 4.75?

SCHOOL GROUNDS DRAWING TO SCALE

1. Measure the area of the school grounds with steel tape.
2. Compute number of square feet.
3. Compute number of acres.
4. Locate school building properly on this scaled drawing.
5. Determine floor area of building.
6. Area of lawn
7. What is net area available for play space.

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